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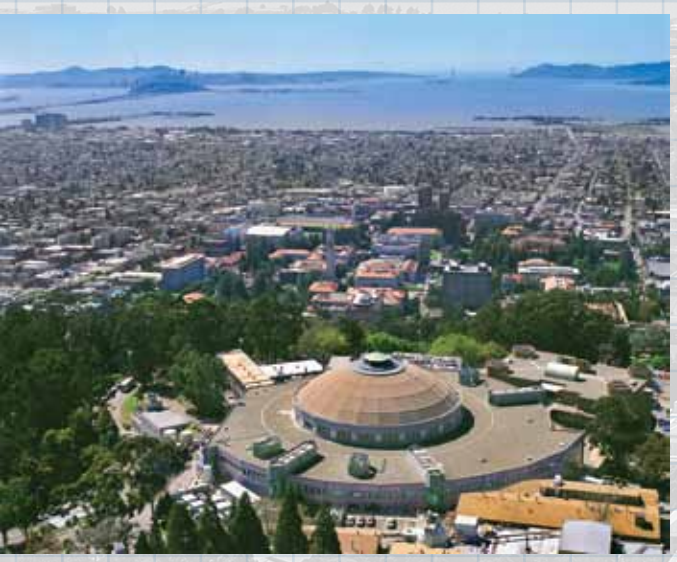

Integrated Environment, Safety & Health Management Plan

Integrated Safety Management (ISM) System

ISM

October 2009

Revision 7

PUB-3140

Integrated Environment, Safety, & Health Management Plan

Integrated Safety Management (ISM) System

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Lawrence Berkeley National Laboratory

Work performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Berkeley National Laboratory, under Contract DE-AC02-05CH11231

Integrated Safety* Management provides important opportunities and advantages for the Lawrence Berkeley National Laboratory and the Department of Energy in the consistent and proper attention to safety[1] and environmental protection essential in the conduct of the Laboratory's missions. This document describes a forward-looking and comprehensive institutional approach and set of requirements for operations and activities, and for the implementation of the Integrated Safety Management System. A high level of attention to environmental protection, safety, health, and performance is of prime importance to the success of the Laboratory and the Department of Energy.

Approved:

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*** Whenever Safety is discussed, the following applies:**
DOE Policy 450.4 Safety Management System Policy "...the term safety is used synonymously with environment, safety and health (ES&H) to encompass protection of the public, the workers, and the environment." Clause I.074 of Contract 31 expands the definition of safety by "including pollution prevention and waste minimization." This footnote indicates that this text is from DOE P 450.4, in which Safety is the original wording and is to mean ES&H.

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NOTICE

This LBNL *Integrated Safety Management System* (ISMS) *Management Plan* is available on the LBNL Web site at the following location:

http://www.lbl.gov/lab-index/i-master-ism.html

Executive Summary

Introduction

The Lawrence Berkeley National Laboratory (LBNL) takes a comprehensive institutional approach to its Integrated Safety Management System (ISMS). This *Integrated Environment, Health, & Safety Management Plan* (*Management Plan*) articulates the institutional requirements for all operations on the main site, and at any other sites where Laboratory staff, guests, and subcontractors work. This *Management Plan* stipulates the requirements for the *LBNL Health and Safety Manual* (PUB-3000) requirement for division-specific documents, and explains the safety and environmental management system mechanisms and a work-planning and authorization process. The *Management Plan* is based upon the Laboratory's contract with the Department of Energy (DOE), the Environment, Safety, and Health (ES&H) Standards, and LBNL ES&H policy stated in the *Regulations and Procedures Manual* (RPM). This Plan addresses the ES&H Standards Set and their incorporation into Laboratory operations. In particular, it includes restatements, clarifications, and new statements of institutional requirements for LBNL operations.

This *Management Plan* is intended for use by the LBNL workforce and is available for those in the University of California (UC) and DOE organizations who review operations, verify compliance, and approve modifications.

Background

LBNL is a government-owned, contractor-operated, multiprogram research and development facility. UC manages and operates LBNL under Prime Contract DE-AC02-05CH11231 for DOE (Contract 31). Contract 31 defines the principles, working relationships, and contractual and legal requirements under which the Laboratory must operate.

The institutional ISMS requirements result from careful examination by LBNL of its approach to safety and the environment. They follow the guidance from DOE Headquarters and the DOE Berkeley Site Office (BSO). They are consistent with Contract 31's requirements and adhere to the ISMS structure described by DOE. The requirements have been refined through an interactive process involving the Laboratory Director, Deputy Director, and all division directors (including selected members of their management, supervisory, and operational staffs).

Policy and Commitment

It is the policy of LBNL to perform all work safely, with full regard to the well-being of workers, guests, the public, and the environment.

Keys to implementing this policy are the following core safety values:

- The institution demonstrates a strong commitment to safety by integrating safety into all facets of its work.
- Managers, supervisors, and work leads are actively involved and demonstrate leadership in performing work safely.
- Individuals take ownership for safety and continuously strive to improve.
- Individuals demonstrate an awareness of and concern for the safety of others.

The Laboratory is committed to doing this while meeting the requirements of Clause I.86 of Contract 31 and implementing the policy provided in DOE P 450.4 (*Safety Management System Policy*) and the specifications and guidance for putting into place an Environmental Management System (DOE Order 450.1A, *Environmental Protection Program*).[1]

The Laboratory affirms that it:

1) Understands and supports the Contract 31 requirement for an ISMS at LBNL and the Contract's opportunities and values;

2) Adopts DOE's Integrated Safety Management (ISM) Objective, Guiding Principles, and Core Functions, and the institutional requirements in this LBNL ISMS *Management Plan* document;

3) Commits to implementing and using ISMS in all its programs, operations, facilities, and activities;

4) Provides responsible occupational safety, health, and environmental (including energy and water use) stewardship in its strategic planning, decision-making processes, and the management of its work activities through the ISMS.

ISMS Management Plan Fundamentals

This *Management Plan* identifies the core requirements that provide the foundation for the integrated safety and environmental management system approach to ES&H management at LBNL. These requirements implement DOE's seven Guiding Principles and five Core Functions.

DOE's Seven Guiding Principles

1) Line Management Responsibility for Safety

2) Clear Roles and Responsibilities

3) Competence Commensurate with Responsibilities

4) Balanced Priorities

5) Identification of ES&H Standards and Requirements

6) Hazard Controls (including environmental controls) Tailored to Work Being Performed

7) Operations Authorization

DOE's Five Core Functions

1) Define the Scope of Work

2) Analyze the Hazards (including environmental impacts).

3) Develop and Implement Hazard Controls (including environmental controls)

4) Perform Work within Controls

5) Provide Feedback and Continuous Improvement

Philosophy

The LBNL overall ES&H philosophy is as follows:

1) In the context of carrying out our technical missions, given the emphasis on doing good science, ES&H is our most important day-to-day consideration.

2) Accidents are preventable through close attention to potential hazards and appropriate action by each individual and the responsible organizations.

3) Responsible stewardship of LBNL's environmental resources is an integral part of this *Management Plan* to promote the reduction of environmental impacts.

4) Managers, supervisors, safety line managers, and work leads are responsible for ensuring that an adequate system is in place to carry out work safely and in an environmentally responsible manner. An identifiable line management chain is ultimately responsible for each work activity.

5) Each supervisor and safety line manager is expected to ensure that all individuals reporting to him or her understand the ES&H expectations, governing work controls, and the means by which they can safely and successfully perform their assignments while providing responsible stewardship of the environmental resources in their care.

6) Each individual is directly responsible for ensuring his or her own safety and environmental stewardship, looking out for fellow workers, and promoting a safe, healthful, and environmentally sound workplace and community. Individuals have the opportunity to participate in the development of ES&H policies and programs. All individuals are to follow ES&H-related work instructions. If the work instructions cannot be followed safely or in an environmentally sound manner as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions.

7) Workers at all levels will be held accountable for their performance with respect to ES&H policies and programs.

Management Chain. Managers are individuals responsible for formulating and administering policies and programs of the Laboratory; collectively, they are the line management. Typically, this includes some level of responsibility for staffing, performance review, work direction and evaluation, and finance. The formal "chain of command" management structure at LBNL starts at the top with the Laboratory Director, and ends with supervisors, safety line managers, or work leads. Examples include but are not limited to program heads, group leaders, department heads, division deputies, superintendents, administrators, supervisors, and work leads.

A matrix supervisor is responsible for providing day-to-day technical direction and oversight, including responsibilities for proper execution of ES&H activities of employees and guests in the work area of another division. The matrix supervisor is the safety line manager for the specified work area and acts on behalf of the division for guests and visitors at the Laboratory. A matrix supervisor partners with the home supervisor on matters of staffing, performance review, work direction, and/or evaluation.

Subcontractors. LBNL's commitment to safety, the environment, and ISM is formally extended to subcontractors and subcontract employees for whom LBNL has ES&H responsibility. All subcontracts will incorporate ES&H requirements, which will then flow down to lower-tier subcontractors, as appropriate.

Graded Approach and Tailoring. ISMS at LBNL provides for a graded approach (i.e., different levels of rigor and formality) when applying controls commensurate with the hazards and environmental impacts involved. To complement this, tailored controls address the hazards and environmental impacts, satisfy the applicable requirements, and provide adequate protection to the public, workers, and the environment.

Work Planning and Authorization. Work is planned, reviewed, and authorized before the activity begins. An appropriate work review is conducted to validate satisfaction of the ES&H requirements. Once the work begins, it is appropriately controlled (workers are responsible for adhering to the ES&H controls; safety line managers and work leads ensure that workers understand the ES&H controls and understand that work is to be performed according to the defined work controls). Safety line managers and work leads make sure workers have access to and knowledge about an activity's governing procedures and work controls.

Feedback and Improvement. Work activities are monitored to ensure the governing procedures and ES&H documents are being followed. Safety line managers and work leads observe their workers at appropriate intervals to verify that work is performed according to the defined ES&H work controls. Workers are to tell their safety line manager, or work lead, of ES&H problems or opportunities for improvement. A worker can stop work if there is an unsafe or unapproved condition. Each division develops and operates an ES&H self-assessment program to guarantee a proactive approach to ES&H and to improve ES&H performance. Also,

divisions are responsible for root-cause analysis and correction of ES&H-related problems. Lessons Learned are to be shared to enhance operational ES&H and facilitate cost effectiveness.

Integration. The integration of program and ES&H planning, from the Laboratory Director down to individual workers, is attentive to the Institution/Facility/Activity Process. Worker involvement is critical to ISM. Thus, an important integration direction is a formalized upward involvement of workers as well as from the top down through the Institution/Facility/Activity Process. At the same time, PUB-3000 and the incorporation of its ISMS fundamentals are basic to Laboratory integration and operations. In this context, all work activities are to be performed according to the provisions of PUB-3000*,* with the assistance of Environment, Health, and Safety (EH&S) Division subject matter experts, division liaisons, and the division safety coordinators. Horizontal integration across the divisions is accomplished through many established groups.

Division Plans and Documents. Because each division has unique programmatic missions coupled with different types of facilities, technical work, hazards, and environmental impacts, the division is responsible for managing how ISM is implemented within its organization. This *Management Plan* specifies those actions that a division must perform. The division-specific approach shall be consistent with this *Management Plan* and PUB-3000 and documented in division-specific ISM *Implementation Plans*. Guidance for the development of these plans is found in Section 6.0 and 8.2 of this *Management Plan*.

PUB-3000. To be in line with the increased formalization brought about by ISM, the Laboratory has assembled broadly used institutional ES&H documents into a formal document structure called the *LBNL Health and Safety Manual* (PUB-3000). This comprehensive manual consolidates many documents into one convenient online package. LBNL performs work to meet PUB-3000 requirements, which are based on the ES&H Standards Set identified for specific Laboratory work and associated hazards and environmental impacts. With the implementation of ISM, employees must understand the latest ES&H requirements and their responsibilities.

Communications and Training. The implementation of an effective ISMS requires a comprehensive communications program that includes training all workers. Laboratory-wide communications and tailored training to support the ISM rollout started in 1999, and continue today. Communication goals include creating ISM awareness and sensitizing employees to environment, safety, and health issues. The intent is for ES&H issues to be a routine part of all Laboratory communications. With the enhancements of the integration of the Environmental Management System into ISMS, additional awareness and responsibility training has been incorporated into the continuing ISMS training.

Standards and Requirements. Contract 31 stands as the fundamental basis for Laboratory operations. It provides the legal foundation for all activities. Clause I.86 of Contract 31 is the foundation of ISM and is consistent with DOE Policy 450.4.

ES&H Standards. Clause I.79 of Contract 31 contains the language providing for ES&H Standards. These Standards establish workplace ES&H controls and are an integral part of ISM. DOE, UC, and LBNL collaborated in a Necessary & Sufficient (N&S) Process to tailor an ES&H Standards Set for LBNL.

Maintenance of the ES&H Standards Set. The Standards can be modified to meet the Laboratory's changing needs. A formal Change Management Process, using the N&S Process, provides an opportunity to keep the ES&H Standards Set up to date.

Flow-Down of Requirements. LBNL operations are addressed through ES&H management processes found in RPM Chapter 7 (*Health and Safety*) and controls noted in PUB-3000. These and other institution-level documents include formal processes for applying requirements locally at the facility and activity levels. A key to the flow-down process is the formal incorporation of the ES&H Standards Set into PUB-3000.

Overview of Revision 7. The current revision (Revision 7) continues the updates made in Revision 6. The fundamental changes:

- The Work Smart Standards process is succeeded by the ES&H Standards process.
- The Safety Review Committee is replaced by the Safety Advisory Committee.
- The Division ISM Plan template is replaced by a checklist.
- Division Safety Committee discussion is moved from the appendix to the body of the document.
- Discussions of Requirements Management, Program Development and Implementation, and Conduct of Operations are added.
- The institutional ISM Improvement Project Plan and process are introduced.
- Updates that further integrate the LBNL Environmental Management System in accordance with DOE Order 450.1A, *Environmental Protection Program*.

1.0 Background

1.1 LBNL Description

Lawrence Berkeley National Laboratory (LBNL) is a government-owned, contractor-operated research and development facility managed and operated by the University of California (UC) for the Department of Energy (DOE) under Prime Contract DE-AC02-05CH11231 (Contract 31).[2] Contract 31 defines the principles, working relationships, and contractual and legal requirements under which the Laboratory must operate and is held accountable.

The work at LBNL focuses primarily on energy and the environment, biosciences and biotechnology, and fundamental science and applied technology.

Since its inception, the Laboratory's location on the hillside above UC Berkeley has offered a unique opportunity for scientific and academic partnerships, and has helped to foster the academic excellence that is the hallmark of the Laboratory's scientific endeavors. Of the Laboratory's staff of approximately 4,500, more than 250 faculty/scientists hold joint appointments with UC Berkeley and other UC campuses. In addition, nearly 800 students and postdoctoral fellows are employed each year, along with more than 3,000 participating guests from institutions around the world.

In addition to its fundamental research, Berkeley Lab's research centers and user facilities provide intellectual resources, services, infrastructure, and unique experimental facilities not found anywhere else in the world, including the Advanced Light Source, the National Energy Research Scientific Computing Center, the Energy Sciences Network, the Molecular Foundry, the National Center for Electron Microscopy, and the Joint Genome Institute.

As of October 2009, LBNL work is conducted primarily at the following LBNL locations:

- The LBNL main site
- Donner Laboratory on the UC Berkeley main campus
- The Joint Genome Institute (JGI) in Walnut Creek
- Berkeley Biosciences West (Potter Street) in Berkeley
- The National Energy Research Scientific Computing Center (NERSC) in downtown Oakland
- The Joint BioEnergy Institute (JBEI) in Emeryville
- Other spaces leased for LBNL (e.g., a warehouse in Richmond)

1.2 ISMS Development Overview

The creation and development of Integrated Safety Management (ISM) in DOE Office of Science operations has evolved over time. The Price-Anderson Amendments Act in 1988 is

seen as a start in ISM. The DOE initiation of the Necessary & Sufficient Standards concept in 1995, which became the Work Smart Standards, continued that process and was superseded by the ES&H Standards process in 2008. The DOE *Safety Management System Policy*, DOE P 450.4,[3] of Oct. 15, 1996, presented the structure to "provide a formal, organized process whereby people plan, perform, assess, and improve the safe conduct of work." It was "institutionalized through DOE directives and contracts to establish the Department-wide ES&H management objective, Guiding Principles, and Functions."[4,5] The applicable Department of Energy Acquisition Regulation (DEAR) amendment followed in 1997, and Clause I.86, *Integration of Environment, Safety, and Health into Planning and Execution*, became part of the UC DOE contract for LBNL on June 1, 2005, as a means of integrating the Environmental Management System into the ES&H *Management Plan*.

This *Management Plan* articulates the institutional requirements for all LBNL operations and provides definition and elaboration of the critical aspects for the understanding and successful implementation of the ISMS.

2.0 Purpose

This LBNL *Integrated Safety Management System Plan* (ISMS, or *Management Plan*) provides a formally approved institutional structure for ISM developed by LBNL to "…systematically integrate safety and environmental stewardship into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment." It contains the LBNL institutional approach for the incorporation and implementation of the DOE *Safety Management System Policy*, DOE P 450.4, using written guidance and continued detailed interaction and coordination from DOE Office of Science (DOE SC) and DOE Headquarters.

It links the ES&H Standards Set to Laboratory operations by providing direction, guidance, and appropriate safety behaviors needed to conduct all activities and operations in compliance with the ES&H Standards Set. With final approval by DOE SC Berkeley Site Office, this *Management Plan* establishes the agreement on the content and processes for ISM implementation and continued use at LBNL.

This *Management Plan* describes the hierarchy of documentation, organization, and commitment for the implementation and continuance of the LBNL ISMS. It starts with Contract 31 and the ES&H standards and is formally implemented through the *Regulations and Procedures Manual* (RPM, PUB-201). Requirements are listed in this *Management Plan* and flow down through the *LBNL Health and Safety Manual* (PUB-3000), and division-specific documentation to address their particular operations, activities, hazards, and environmental impacts. Key features in the ISM are the use of the graded approach and the concept of "tailoring commensurate with the hazards and environmental impacts," which is critical for practical and affordable implementation. Worker involvement is also important and is actively sought out throughout the work review, authorization, and execution process. The hierarchy of these documents is displayed in Figure 2.1.

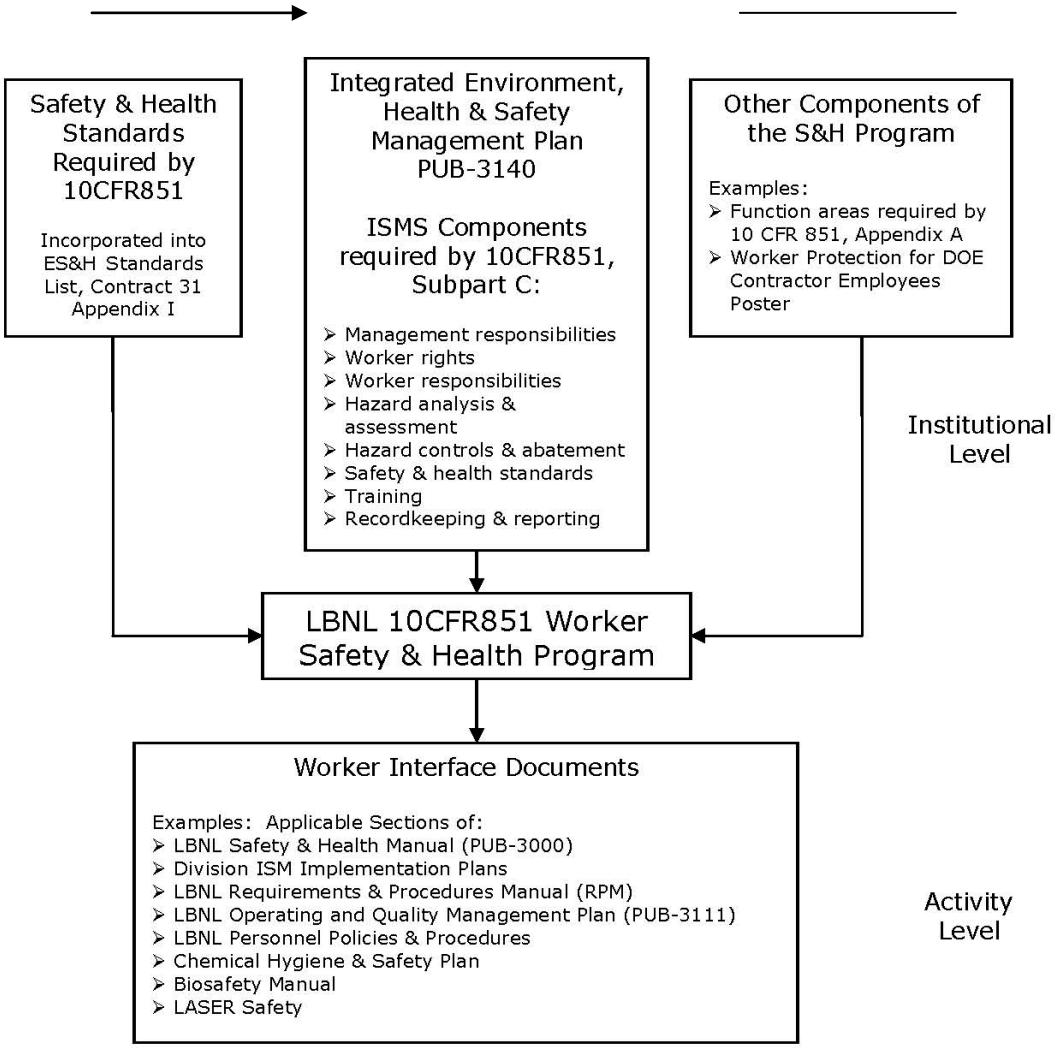

Figure 2.1 LBNL Document Hierarchy: Functional relationship between the DOE contract and ES&H Standards and the LBNL ES&H policy and implementing elements.

The most significant documents in this context are listed below, with their URLs.

LBNL/PUB-201, *Regulations and Procedures Manual* (RPM):

http://www.lbl.gov/Workplace/RPM/

LBNL/PUB-3140, *Integrated Environment, Health, & Safety Management Plan:*

http://www.lbl.gov/ehs/ism/ism_06.pdf

LBNL/PUB-3000, *Health and Safety Manual*:

http://www.lbl.gov/ehs/pub3000

LBNL *ES&H Standards Set*:

http://labs.ucop.edu/labprimecontracts/LBNL/esh_std_lbnl.pdf

LBNL/PUB-3851, *Worker Safety and Health Program*:

http://www.lbl.gov/ehs/safety/assets/docs/LBNL-PUB-3851.pdf

LBNL/PUB-3180, *Environmental Management System Plan:*

http://www.lbl.gov/ehs/esg/EMS%20Plan/assets/EMS%20Plan_0309.pdf

LBNL/RPP, LBNL *Radiation Protection Program*: PUB-3000 Chapter 21

http://www.lbl.gov/ehs/pub3000/CH21.html

LBNL/PUB-5341, *Chemical Hygiene and Safety Plan*:

http://www.lbl.gov/ehs/chsp/index.shtml

Biological Safety Program Manual:

http://www.lbl.gov/ehs/biosafety/Biosafety_Manual/biosafety_manual.shtml

LBNL/PUB-3111, *Operating and Quality Management Plan*:

http://www.lbl.gov/DIR/OIA/assets/docs/OCA/About%20OCA/Operating%20and%20Quality%20Management%20Plan%20Signed.pdf

LBNL/PUB-3092, *Guidelines for Generators to Meet Hazardous Waste Handling Facility Acceptance Requirements*:

http://www.lbl.gov/ehs/waste/wm_pub_3092.shtml

This *Management Plan* contains the institutional requirements for all ES&H activities at LBNL. Considerations for the ES&H Standards Set that were approved and incorporated into the Contract are included. The development, approval, and delivery of this updated *Management Plan* satisfies a key requirement of Clause I.86 of Contract 31, effective June 1, 2005.

This *Management Plan* is intended for use by the entire LBNL workforce, including subcontractors. Similarly, it is available to those in the University of California and DOE organizations with ISM, ES&H, oversight, and Contract responsibilities.

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3.0 SCOPE

This *Management Plan* applies to the work authorized under Contract 31, which, in addition to Research and Development, includes administrative and operational support functions such as business operations, facility construction and maintenance, and security and emergency response activities. LBNL and DOE may mutually agree to develop additional authorization agreements for specific facilities or activities. All facilities and activities at LBNL not specifically operating under an authorization agreement, or a separately approved *Integrated Safety Management System* (ISMS) *Management Plan*, are authorized when following this *Management Plan* using the procedures described in PUB-3000 Chapters 1, 6, 31 and 32.

This *Management Plan* presents the institutional requirements and major methods for the implementation of ISMS into all operations and activities at LBNL. It is based on the provisions of Contract 31 and the requirements of the ES&H Standards Set.

LBNL accomplishes its institutional role in the DOE ISM Institution/Facility/Activity Process by a combination of Laboratory-wide or infrastructure functions, and division or operating-unit functions. The Laboratory-wide functions are those that affect all LBNL operations and employees. The divisions participate by administering the program funding, managing the people, operating the facilities, and conducting the activities. The word “institution” is used instead of “site” or “site-wide” because many LBNL activities also occur off the main site and all LBNL activities must be covered by the ISMS.

At LBNL, facilities are defined as portions of buildings, individual buildings, or groups of buildings that fulfill a specific purpose. A building manager is appointed for each facility by the responsible division director and is readily identifiable and available (e.g., name and contact information is posted). For the areas between buildings, the responsible organization is the Facilities Division. In situations where programmatic activities are outdoors, the cognizant program division has the responsibility for the local area involved. Building manager responsibilities are described in PUB-541.

Many LBNL personnel are assigned to or interact with a wide variety of outside organizations including other DOE sites, the U.S. Department of Health and Human Services, the Department of Defense, and other governmental agencies, as well as overseas organizations in various action and inspection capacities. This results in heavy travel traffic, with its own safety hazards and environmental impacts, during the course of Laboratory business. LBNL personnel in these situations have had training in the LBNL ISMS, both institutional and from their divisions, and are expected to appropriately use the process in the conduct of their official activities and assignments. Those at other DOE sites—e.g., DOE Headquarters, Brookhaven National Laboratory (BNL), Argonne National Laboratory—either visiting or on assignment, are expected to work according to the ISMS and any accompanying agreement structures with the organizations operating at those sites. The *Division Implementation Plans* and any succeeding documentation provide the specifics for their off-site personnel and connections.

For work carried out in LBNL and UC Berkeley spaces, a "Partnership Agreement" has been renewed that clarifies responsibilities and oversight of safety and environmental requirements. Although the Berkeley campus and Berkeley Laboratory safety systems and procedures differ, they are consistent with the principles of integrated safety management and provide equivalent protection.[6] This is discussed further in Section 5.8.

The Laboratory will periodically review this *Management Plan* and make feedback and improvement changes as described in Section 8.4. The initial review will occur at or about the anniversary date of its DOE Office of Science, Berkeley Site Office approval. This review provides a process to evaluate what is working and what needs improvement, and to address any new initiatives and proposals. It permits a comprehensive maintenance of the *Management Plan* and the opportunity to keep it current. This review goes beyond the action-oriented type of changes that are most likely in the ongoing ES&H Standards Change Management Process. The LBNL EH&S Division PUB-3000 Manager is responsible for posting the currently approved ISMS *Management Plan* to the EH&S Web site.

4.0 ISMS System Overview

4.1 Introduction to the Integrated Safety Management System (ISMS)

ISMS is the means by which ES&H requirements are integrated into the planning and execution of work. It consists of two related components: organizational structure (arrangements of people) and underlying principles and operations (functions or processes). DOE and its contractors must systematically integrate ES&H into management and work practices at all levels, from work planning to execution. In summary, the overall management of ES&H functions and activities becomes an integral part of mission accomplishment.

DOE has defined seven Guiding Principles that are the fundamental policies for DOE and its contractors to use in the management of ES&H. They are:

1) Line Management Responsibility for Safety
2) Clear Roles and Responsibilities
3) Competence Commensurate with Responsibilities
4) Balanced Priorities
5) Identification of ES&H Standards and Requirements
6) Hazard Controls (including environmental controls) Tailored to Work Being Performed
7) Operations Authorization

DOE has defined five Core Functions for integrated ES&H management that make up the underlying process for any work activity that could affect the public, the workers, and the environment.

1) Define the Scope of Work. Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.
2) Analyze the Hazards. Hazards and environmental impacts associated with the work are identified, analyzed, and categorized.
3) Develop and Implement Hazard Controls (including environmental controls). Applicable standards and requirements are identified and agreed upon, controls are established to prevent and/or mitigate hazards, environmental impacts are identified and evaluated for reduction, the ES&H envelope is established, and controls are implemented.
4) Perform Work within Controls. Readiness is confirmed and work is performed within the ES&H envelope established.
5) Provide Feedback and Continuous Improvement. Feedback information on the adequacy of controls is gathered, the efficiency of reducing environmental impacts is researched,

opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight are conducted, and, if necessary, regulatory enforcement actions occur.

These five Core Functions are applied as a continuous cycle with the degree of rigor appropriate to address the type of work activity and the hazards and/or environmental impacts involved. The ISM Work Cycle, as displayed in Figure 4.1, shows the continuous relationship of the functions.

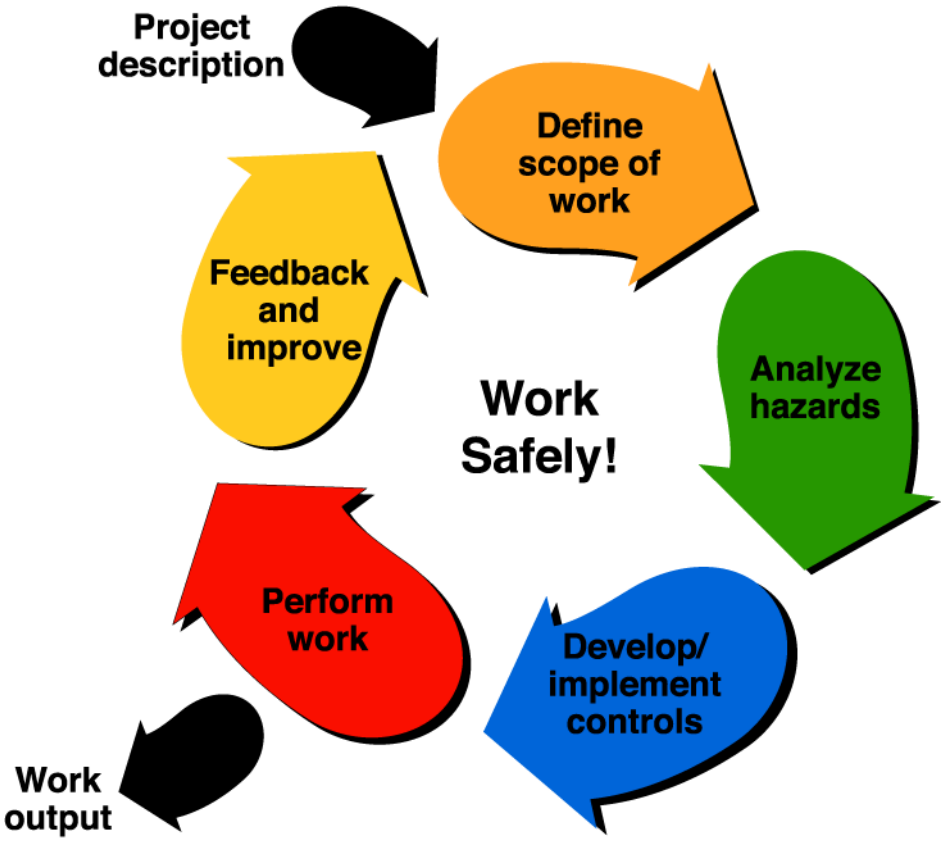

Figure 4.1 Basic ISM Work Cycle

Environmental concerns are included in the ES&H *Management Plan* at each step of the ISM Work Cycle. However, as mandated by and in conformance with DOE Order 450.1A, *Environmental Protection Program*, the Laboratory has developed the LBNL Environmental Management System DOE Guidance[1] assists with defining how the two systems integrate with each other.

4.1.1 Implementation

Implementation of the ISM Work Cycle takes place at multiple organizational levels, including the institutional level, the division or facility level, the activity level, and the individual level. The Laboratory's ISMS and Environmental Management System (EMS) functions performed at the institutional level are to: (1) clarify missions; (2) establish ES&H policies, objectives, and

expectations; (3) select a tailored set of ES&H standards; (4) generate and authorize use of PUB-3000 and other direction and guidance; and (5) assess overall system performance. Much of the information produced at the institutional level is used to set expectations that ES&H functions are performed during programmatic and institutional work at the facility and activity levels.

To benefit from both locally developed processes and controls and institutional consistency, the Laboratory uses the DOE Guiding Principles, Core Functions and EMS principles in managing division and activity work planning and execution while retaining a required level of institutional uniformity through a set of division-level ISM implementation plans. Doing so results in practices and controls tailored to both activity-level and division or facility-specific management needs, and meets uniform expectations at the institutional level.

At the division or facility level, this *Management Plan* ensures safe and environmentally responsible operations of the facility's infrastructure and activities. This means that the DOE Guiding Principles, Core Functions and the EMS principles of this *Management Plan* are followed not only in operating the facility, but also in ensuring the activities performed in that facility are within the facility's ES&H envelope and are compatible with one another. For this reason, facility-management concurrence is required before activities can start within the facility.

Although the Laboratory's ISMS activity-level functions involve many of the same positions and organizations as those at the institutional level, the information generated and shared is different. At the activity level, management is concerned about such items as technical approaches; reaching specific work objectives; resources and schedules; hazards and environmental impacts analysis associated with the specific work; acceptable controls for protection; hardware, facilities, methods, environment, and staff; and authorization to proceed.

4.1.2 Improvement

Organizational structure, functions, and information sharing are all necessary for the successful management of ES&H integration. LBNL, UC, and DOE Berkeley Site Office develop annual objective measures that gauge the Laboratory's management system performance (*Performance Evaluation and Measurement Plan*). Mutually developed ES&H performance measures are important gauges of *Management Plan* effectiveness. In addition, objectives and targets are established by LBNL to reduce the impacts of the Laboratory's significant environmental impacts. Plans are developed and put into place to continuously improve LBNL's environmental performance. Results are measured and reported annually to the senior Laboratory management and DOE.

4.2 LBNL ES&H Policy Statement

It is the policy of LBNL to perform all work safely with full regard to the well-being of workers, guests, the public, and the environment.

Keys to implementing this policy are the following core safety values:

- The institution demonstrates a strong commitment to safety by integrating safety into all facets of its work.
- Managers and supervisors are actively involved and demonstrate leadership in performing work safely.
- Individuals take ownership for safety and continuously strive to improve.
- Individuals demonstrate an awareness and concern for the safety of others.

4.3 Philosophy

LBNL's overall ES&H philosophy is as follows:

1) Accidents are preventable through close attention to potential hazards and appropriate action by each individual and the responsible organizations.

2) Responsible stewardship of environmental resources is an integral part of this *Management Plan,* resulting in the reduction of environmental impacts locally, regionally, and globally.

3) Managers, supervisors, safety line managers, and work leads are responsible for ensuring that an adequate system is in place to carry out work safely while also being environmentally responsible. An identifiable line-management chain is ultimately responsible for each work activity.

4) Each supervisor and safety line manager is expected to ensure that all individuals reporting to him or her understand the ES&H expectations, governing work controls, and the means by which they can safely and successfully perform their assignments while providing stewardship of the environmental resources in their care.

5) Each individual is directly responsible for ensuring his or her own safety and environmental stewardship, looking out for fellow workers, and promoting a safe, healthful, and environmentally sound workplace and community. Individuals have the opportunity for involvement in setting policy, establishing coordinating processes, and in assessment and continuous improvement activities. All individuals are to follow ES&H-related work instructions. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions.

6) Employees at all levels, contractors, and participating guests will be held accountable for their performance with respect to ES&H policies and principles.

4.4 Overarching ISMS Responsibilities

It is each individual's responsibility to: (1) understand the Laboratory's ES&H policy and to participate in its pursuit; (2) determine in concert with others the best way to achieve ES&H goals in conformance with Laboratory requirements and to participate in the development of Laboratory policy and procedures in a constructive manner; (3) use appropriate available resources; and (4) ask for any help necessary to ensure a safe work environment and to reduce

environmental impact, while performing a broad set of job responsibilities and pursuing all technical, administrative, or craft objectives.

Managers, supervisors, and work leads must specify the technical, administrative, craft, and ES&H goals; assign specific responsibilities; appropriately define and manage ES&H issues; provide the necessary resources to accomplish the objectives; ensure compliance; monitor, measure, and evaluate performance against targets, where applicable; modify and improve upon processes as necessary; and reward each individual appropriately.

To achieve the ES&H goal, work at LBNL will be done using PUB-3000 with the direct assistance and support of the EH&S Division subject matter experts and the division liaisons.

Divisions must ensure that work is performed consistent with the requirements and expectations specified in this institutional *Management Plan*. The authorizing organization (i.e., the division director) is responsible for authorizing specific work activities. Authorizing organizations are distinguished by having control of the funding. Organizations authorizing work and the associated management chain are responsible for ensuring that all work in their purview is conducted safely while providing responsible stewardship of the environmental resources in their care. Individuals must follow ES&H safe work instructions, including signage, Job Hazard Analysis (JHA) requirements, and work procedures.

4.5 Institution and Division ISMS Interface

This *Management Plan* defines the ISM core philosophy, requirements, and parameters for the LBNL workforce and work environment. The requirements established in this *Management Plan* serve as the basis for Chapter 1 (*General Policy and Responsibilities*) in PUB-3000 and the division ISM *Implementation Plans*. In turn, these documents detail the Laboratory's ES&H policies, practices, and individual responsibilities. The ES&H Standards Set in Contract 31 is the currently applicable set of ES&H standards, and serves as the basis for PUB-3000.

All LBNL work activities must be performed in conformance with the provisions of PUB-3000, the EMS Plan, and the division ISM *Implementation Plans* with the assistance of ES&H subject matter experts. Individuals are responsible for following all ES&H-related work instructions. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions. Because of the significant differences in the nature of operations across the Laboratory, each division director has the responsibility for ensuring that organizational missions are carried out in conformance with the philosophy, parameters, and requirements defined in this *Management Plan* and PUB-3000. To facilitate this outcome, each division director has the responsibility for ensuring that ISM requirements are implemented within his or her division. Division-specific ISMS *Implementation Plans* must be used for this purpose. A checklist for division ISMS *Implementation Plans* is found in Appendix A. Annual reviews of each division's ISMS *Implementation Plan* are undertaken by the EH&S

Division to ensure continued adherence of each division's operations to the philosophy, requirements, and parameters established in this institutional ISM *Plan*.

4.6 Structure for ES&H Management in LBNL Operations

The division directors have the direct responsibility and authority for authorizing and oversight of the Laboratory's programmatic work, and primary responsibility for applying and fulfilling the Laboratory's ES&H policies in the performance of that work. Division directors must be aware of statutory, regulatory, and contractual ES&H requirements applicable to their operations and facilities. In meeting their obligations, each division director can simultaneously function in one or more of four operational functions: program division director, home/payroll division director, facility division director, and services division director. Authorities for the different operational functions vary, but the program division director has the primary responsibility. For many mission projects, the program division director is also the home/payroll, facility, and services division director.

Division directors have safety coordinators and Safety Advisory Committee (SAC) members on their staffs, as well as a Division Safety Committee to support the division's ES&H activities. The LBNL SAC is a council composed of representatives from each of the divisions, and provides high-level counsel to the Laboratory Director and Chief Operating Officer on ES&H policies. The EH&S Division assigns liaisons to each division and the Director's Office. In addition, experts from outside the Laboratory can be called in when needed. Roles and responsibilities of EH&S Division liaisons, division safety coordinators, and the SAC are provided in Sections 5.3.8, 5.4, and 5.5 of this document, and are expanded upon in PUB-3000, Chapter 1.

4.7 ISMS Development and Continuous Improvement Process

4.7.1 ISMS Preparation

The initial LBNL ISMS *Management Plan* was developed, verified, and authorized in 1999 after significant foundational work was completed. The initial ES&H Standards list was developed and added to the DOE contract. Each work activity was identified and evaluated for hazards as part of the initial Integrated Hazard Assessment (IHA) with an accompanying IHA database. The hazards were cataloged and ranked in another database that has become the current Corrective Action Tracking System (CATS).

The underlying processes associated with the hazard- and impact-analysis elements of ISMS have matured. The IHA database has been superseded by the Hazards, Equipment, and Authorizations Review (HEAR) system; this Web-based tool allows division users direct access to information relevant to the identification and evaluation of hazards associated with their operations. The emphasis is on division-user maintenance and use of the data. The Job Hazard Questionnaire (JHQ) has been enhanced by the addition of the Job Hazard Analysis (JHA) process. Every worker must have a current Individual Baseline JHA authorizing regular and routine work that may be performed.

Revision 6 of the ISMS *Management Plan* was a significant revision of the prior versions. It realigned the described roles and responsibilities to the current LBNL operating practices and organizational structure. The revision addressed the issues brought forward in the 2006 Peer and ISM Evaluation Reviews. It took into account the many changes to worker safety and health program elements placed into PUB-3000 during the implementation of the 10CFR851 *Worker Safety and Health Program* rule. It also wove the EMS back into the fabric of the overall ES&H program described in the ISMS *Management Plan*, rather than patching it on top of the Plan. This document was reorganized to follow the basic structure of DOE P 450.4 *Safety Management System Policy* outline, and to provide a clear overview of how LBNL manages its ES&H responsibilities. It provided a strengthened foundation for future continuous improvement.

The current revision (Revision 7) continues the updates made in Revision 6. The fundamental changes are:

- The Work Smart Standards process is succeeded by the ES&H Standards process.
- The Safety Review Committee is replaced by the Safety Advisory Committee.
- The Division ISM Plan template is replaced by a checklist.
- The institutional ISM Improvement Project Plan and process are introduced.

4.7.2 Future Evaluations of the ISMS

As management and organizational changes take place at the Laboratory, any new divisions will need to perform reviews to evaluate their compliance status with this *Management Plan*, and develop their division-specific documents with the associated division gap analysis. The Plan will be reviewed and appropriate revisions will be made on an annual basis as described in Section 8.4.

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5.0 Environment, Safety, Health, and Assurance Organization Responsibilities, Services, and Interfaces

5.1 Introduction

This *Management Plan* addresses all aspects of the ES&H program in the Integrated Safety Management System (ISMS) at LBNL; however, the interfaces among specific environment, safety, and health organizations deserve additional attention. This section addresses the Laboratory's Environment, Health, and Safety (EH&S) Division's charter, organization, and administrative responsibilities and authorities. It also describes the EH&S Division's relationships with other LBNL organizations that participate in the overall ES&H process, including the UC Berkeley campus. It should be noted that DOE addresses the subject area of Environment, Safety, and Health as "ES&H." It should be distinguished from the LBNL division name of the EH&S Division.

5.2 Environment, Health, and Safety Division (EH&S Division)

5.2.1 EH&S Division Charter

The primary objective of the EH&S Division is to provide the necessary support to LBNL for protecting its workers, the public, and the environment from adverse consequences, and for improving ES&H performance.

- The EH&S Division supports and acts as a partner with line management as it meets direct responsibilities to ensure that the protection of workers, the public, and the environment are integrated into the primary research and support functions of each division or unit.

- The EH&S Division supports and provides expertise directly to each LBNL worker who seeks ES&H advice or help, or voices a concern.

In carrying out its primary mission, the EH&S Division is committed to seven basic goals:

- Provide employees with a safe workplace.

- Design and operate facilities and research activities that are safe, conserve resources, and minimize adverse impacts on public health and the environment.

- Procure and use materials that prevent pollution or that minimize wastes, and which can be disposed of properly.

- Promptly communicate to affected persons the known hazards of our activities and the related methods necessary for safety and health protection.

- Maintain a positive, proactive, and constructive relationship with our neighbors in the local community, representatives from external regulatory agencies and the Department of Energy, and other stakeholders.

- Use available technology, engineered safeguards, and responsible science to mitigate all significant risks arising from its research and related activities.

- Train and develop staff to meet the commitments to a safe workplace, and minimize adverse impact on public health and the environment.

5.2.2 EH&S Division Organization and Administrative Responsibilities and Authority

The EH&S Division is organized into seven functional areas: Security & Emergency Operations, Waste Management, Radiation Protection, Environmental Services, Health Services, Industrial Hygiene, and Occupational Safety. Security & Emergency Operations includes the Fire Department, which is contracted to Alameda County. Environmental Services includes Environmental Restoration. Radiation Protection includes Technical Services. Group leaders of these functional areas report directly to the Division Director.

The group leaders are responsible for managing their organizations, including planning, staffing, and budgeting, and for developing and implementing Laboratory policies and procedures in their functional areas. The Division Director and group leaders represent the EH&S Division in its communication with internal and external organizations and individuals on matters of major significance to the success of LBNL.

To enhance service, EH&S Division liaisons are designated for each Laboratory organization. These individuals are considered points of contact between a customer division (typically via a division safety coordinator) and the EH&S Division. They function as troubleshooters, facilitators, and problem solvers. Support services include providing technical consultation and responsive customer service; partnering with customers to implement cost-effective injury and illness prevention/loss control programs; assisting line management with division ES&H (Safety) Plans; and providing quarterly ES&H briefings to customer division management. This relationship does not preclude any Laboratory employee from directly approaching an EH&S Division professional/subject matter expert to address a particular issue or need.

Current information regarding the EH&S Division points of contact, policies and procedures, and other ES&H-related information is maintained on the EH&S Division Web site at:

http://www.lbl.gov/ehs/

5.3 EH&S Division Functional Groups

5.3.1 Security & Emergency Operations

The mission of the Security & Emergency Operations Group is to provide integrated and efficient safety, emergency, and security services to all employees, guests, and users at the main Berkeley site and off-site facilities, and to promote continuous improvement of the Laboratory's scientific and supportive activities. The core competencies of the group are:

- Emergency response to include fire suppression, emergency medical, hazardous materials response services and primary responsibility for operation of the Emergency Operations Center;
- Emergency planning, drills, and exercises;
- Fire protection engineering;
- Law enforcement services;
- Site access control;
- Physical security;
- Parking permit and badging services;
- Self-assessment and quality assurance of EH&S Division activities.

Operational guidance for these functional program areas are found in PUB-3000 (Chapters 9 and 12) and the *Integrated Safeguards and Security Management Plan* for the Laboratory, available on the Web at:

http://www.lbl.gov/ehs/security/ufva/issm/ISSMfinal.html.

5.3.2 Waste Management Group

The Waste Management Group (WMG) is responsible for managing radioactive, mixed, hazardous, medical, and universal wastes from the generator site to final disposition including interim storage at the Hazardous Waste Handling Facility (HWHF). These responsibilities include safe collection, accumulation, eventual transport, and disposal of waste. Waste generators are provided with training and oversight applicable to the waste streams generated to ensure that they can discharge their responsibilities in meeting the policies and purpose of WMG. To this end, WMG provides advice and counsel to Berkeley Laboratory personnel on compliant management of waste in the generating area.

LBNL policies requiring that all operations be performed in a safe and responsible manner apply to waste-generation and -handling operations. LBNL waste management policies include the following guidelines:

- Comply with all laws and regulations governing hazardous, radioactive, mixed, universal, and medical/biohazardous wastes.
- Remove these wastes from generator areas safely and efficiently.
- Minimize the wastes generated at Berkeley Laboratory.

- Operate the HWHF in a manner that complies with all permits, safety analysis, and regulations.
- Advise and consult with waste generators during the work-planning process to minimize waste and to ensure safe accumulation and handling of waste, as needed.

WMG incorporates all ES&H Standards appropriate to its ultimate goal of providing a healthy, safe, and compliant workplace. All activities follow the principles of the Integrated Safety Management System (ISMS), which may be called upon to address specific issues as noted in the institutional or division ISM plans. Specific processes and procedures are identified in a variety of documents such as PUB-3000, and relevant WMG documents such as the HWHF *Resource Conservation and Recovery Act* Part B permit, the HWHF *Safety Analysis Document*, the HWHF *Health and Safety Plan*, the WMG *Quality Assurance Plan*, and the WMG *Radioactive Waste Management Basis*.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of WMG are delineated in PUB-3000, Chapter 20; *Guidelines for Generators to Meet HWHF Acceptance Criteria* (PUB-3092); operational and activity policy and procedure documents; and division ISM *Implementation Plans*. To ensure that responsibilities for generating and handling waste are understood, the guidance in PUB-3000 is supplemented by required waste-specific training and consultation on waste issues as needed by individuals, groups, and major projects, including construction and renovations.

5.3.3 Radiation Protection Group

The Radiation Protection Group (RPG) supports research programs by facilitating safe and compliant use of radiation sources at the Berkeley Laboratory, and provides technical services to support this effort.

The RPG provides effective leadership to LBNL by promoting compliance with applicable DOE orders and federal rules/regulations, and overseeing a radiologically and environmentally safe working environment for all LBNL employees, contractors, and guests in accordance with Integrated Safety Management (ISM) principles. The RPG staff ensures operational adherence to the LBNL Radiation Protection Program (RPP) and oversees implementation of RPG programs including the Radiological Work Authorization and Radiological Work Permit Programs, Sealed Source Authorizations, Radiation Safety Training, X-ray, Nuclear Material Management Safeguards and Security, Transportation, General License Authorizations, Low Activity Source, etc. The Group interacts with LBNL management, researchers, project scientists, and EH&S Division personnel to ensure that EH&S Division objectives are integrated into program operations, and that EH&S Division recommendations have a sound technical and scientific basis. The Group Leader serves as Radiation Control Manager (RCM) to provide guidance to senior management on matters pertaining to radiation safety, support to the Radiation Safety Committee (RSC) for the review of authorizations, and reporting and data analyses in support of the ALARA process.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the RPG are delineated in PUB-3000 (Chapter 21).

5.3.3.1 Technical Services

The Technical Services (TS) organization is responsible for developing, planning, and managing all aspects of TS initiatives and technical programs. It oversees all technical, management, quality assurance, production, customer relations and service, personnel, EH&S, compliance, and budget functions for TS, which includes internal and external dosimetry, instrumentation, telemetry, radioanalytical labs, and accelerator health physics. It provides managerial and technical leadership to projects of division-wide importance. It works with EH&S Division managers and group leaders and staff across the Laboratory, at other DOE Office of Science labs, in the University of California Office of the President, and in the Berkeley Site Office to develop and implement solutions to complex problems of importance to the Division and the Laboratory. It is also responsible for ensuring that TS programs and operations are in compliance with applicable policies, procedures, and regulations as stipulated in the LBNL RPP and as communicated by the RCM.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the TS organization are delineated in PUB-3000 (Chapter 21).

5.3.4 Environmental Services Group

The Environmental Services Group (ESG) is responsible for managing the environmental protection programs designed to reduce the Laboratory's impacts on air, water, soil, and other environmental media, and to conserve natural resources. These programs include:

- Air Quality Protection
- Environmental Management System
- Environmental Radiation Protection
- Environmental Restoration
- Hazardous Materials Management
- Storm Water Protection
- Wastewater Discharges

It is the Laboratory’s goal to perform work in a manner that protects the health of the public and preserves the quality of the environment. The Laboratory is committed to:

- Achieving compliance with all applicable laws, regulations, and requirements;
- Minimizing waste and preventing pollution;
- Aggressively correcting and cleaning up existing environmental problems;
- Continually improving environmental performance.

ESG is responsible for developing these programs and ensuring that they are effectively managed, implemented, and improved. Effective implementation and improvement of these programs are achieved by means of the LBNL Environmental Management System (EMS, PUB-3180). The EMS Plan requires that a continual cycle of planning, implementing, evaluating, and improving processes be performed to achieve the purpose and goals of each of the programs in the comprehensive environmental protection program. Each year under this Plan, environmental aspects are identified, and their impacts to the environment are evaluated. Objectives and

targets are developed for each aspect that is determined to have a significant environmental impact.

Environmental Management Programs are prepared to document actions necessary for reducing certain environmental impacts and for identifying responsible parties and associated target deadlines for each action. Annually, an internal assessment is performed to evaluate the progress of the EMS in sustaining and improving environmental protection performance, and an LBNL senior management team reviews the results. At least once every three years, a third-party audit is performed to validate that the EMS is being implemented and is performing as stipulated in the EMS Plan. Environmental Compliance Audit and Assessment Plans have been prepared for each program. These describe the elements of each program that undergo a technical review on a quarterly basis.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the ESG are delineated in PUB-3000 (Chapter 11). The responsibilities of the environmental protection program are stipulated in the EMS Plan and in the operational policy and procedure documents specific to each environmental protection program.

5.3.5 Health Services Group

The LBNL Health Services Group provides comprehensive occupational medicine services to LBNL full-time employees, part-time employees, or all employees who participate in a medical surveillance program. Health Services policy ensures that employees are physically able to perform assigned duties, and that employees with an occupational illness or injury receive medical care and rehabilitation. The policy also provides for emergency treatment for serious illnesses or injuries. The policy encourages all employees to maintain their physical and mental health, and assists in maintaining a healthy and safe work environment. Health Services also supports LBNL's provision of employee benefits through the Disability Management Program, which provides counseling and helps injured and ill employees rehabilitate and return to work safely. The Human and Animal Regulatory Committees Office in Health Services coordinates the Laboratory's animal welfare and human subjects protection programs, including the associated oversight committees.

Health Services is available to all employees hired for 30 days or more, or any employee subject to a medical surveillance program. First aid and/or emergency services may be provided to subcontractors and guests until they are referred to their employer for industrial injury care or their personal physician for nonindustrial illnesses.

The Health Services Clinical Program manages medical surveillance; provides preplacement, termination, and periodic health evaluations; provides first aid, initial assessment of injuries and illnesses, and appropriate referrals; provides case management; and contributes to health promotion through its Wellness Program. The program staff works closely with other EH&S Division staff to ensure the existence of an effective Medical Surveillance Program, and with staff from Human Resources to help implement the Laboratory's Return-to-Work Policy.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the Health Services Group are delineated in PUB-3000 (Chapter 3). The responsibilities of

the Committee for Protection of Human Subjects and the Human Subjects Committee, both supported by the Health Services Group, are given in PUB-3000 (Chapter 22).

5.3.6 Industrial Hygiene Group

The Industrial Hygiene Group provides industrial hygiene services to support the Laboratory's mission. This includes anticipation, recognition, evaluation, and control of health hazards that may be found in the workplace. Its activities support illness-prevention and loss-control systems for customer service and technical consultation to achieve ISM. Core program functions provided to support the Division and the Laboratory include the Chemical Hygiene and Safety Program, the Biosafety Program, and other hazardous material control programs.

The Group's technical occupational health focus is on preventing illness resulting from exposure to toxic materials or harmful physical agents such as noise or nonionizing radiation. It provides comprehensive technical safety support including chemical hygiene; industrial ventilation; asbestos, beryllium, and lead control; respiratory protection; and laser safety.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the Industrial Hygiene Group are found in PUB-3000 (Chapter 4). Many hazard-specific control programs are found as control program documents under this chapter (e.g., noise, asbestos, and beryllium). Additional technical program descriptions are found in PUB-3000, Chapters 7, 13, 16, and 26.

5.3.6.1 Chemical Hygiene and Safety Program

LBNL policy requires that all operations be performed in a safe and responsible manner. This includes maintaining personnel exposure to chemical agents within acceptable exposure limits. This policy further requires that exposures be minimized by the use of hazard elimination, engineering controls, personal protective equipment, and administrative controls. It is a requirement of employment and a precondition for using Laboratory facilities that every employee, guest, visiting scientist, or contractor working on or off site be familiar with and comply with LBNL safety standards.

The purpose of the Chemical Hygiene and Safety Plan (CHSP) is to provide guidance to all LBNL supervisors, employees, contractors, visitors, and guests for the safe handling, use, and storage of hazardous materials in laboratory, shop, and office settings. This plan identifies LBNL, division, department, supervisor, and employee responsibilities, and establishes procedures for identification, evaluation, and control of hazardous materials.

The scope of the CHSP includes the requirements of the federal Occupational Safety and Health Administration (OSHA) *Hazard Communication Standard* (29CFR1910.1200) for employees in shop and office settings, and the OSHA *Occupational Exposures to Hazardous Materials in Laboratories* (29CFR1910.1450) for laboratory employees.

The *Hazard Communication Standard* was developed to inform employees who work with hazardous chemicals of the risks associated with those chemicals. A separate standard (the *Laboratory Standard*) was specifically developed for laboratory operations, because these environments often differ from industrial and office settings in the use and handling of hazardous chemicals.

LBNL combined both of these federal OSHA requirements into the CHSP in order to establish a standardized framework for chemical hygiene practices, information dissemination, and training at the Laboratory, regardless of the occupational setting.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the CHSP are delineated in broad categories in the Plan, and are tailored to specific needs in the PUB-3000 (Chapters 4, 6, 7, 12, 13, 19, 24, 26, 32), operational and activity policy and procedure documents, and division ISM *Implementation Plans*.

5.3.6.2 Biosafety Program

LBNL policy requires that work with biological materials or agents be conducted in a safe, ethical, environmentally sound, and compliant manner using the principles and functions of ISM and work authorization. Work will be performed in this manner so that personnel and the environment will be protected from exposure to biological agents or materials that may cause illness to workers or people, or damage to agriculture or the environment.

The purpose of the Biosafety Program is to provide requirements, guidance, responsibilities, and implementation systems to LBNL supervisors, employees, guests, and contractors for the safe use, storage, and inactivation of potentially hazardous biological agents or materials in laboratory or other work environments. The Biosafety Program structure, requirements, guidance, and implementation systems are detailed in Chapter 26 (*Biosafety*) of PUB-3000 and the Web-based program description and *Biosafety Manual*.

The Biosafety Program includes the following goals:

- Prevent illness to workers or others from exposure to biological agents or materials used at LBNL.
- Prevent agricultural or environmental damage from biological agents or materials transferred or disposed of by LBNL.
- Provide requirements and implementation systems for administrative, engineering, and personal protective equipment biosafety controls,
- Provide required biosafety training.
- Provide an environment for high-quality biological research while maintaining a safe workplace.
- Comply with applicable federal, state, and local requirements, regulations, and guidelines.

The Biosafety Program covers a broad range of organisms, cells, viruses, and other materials of biological origin that pose various levels of risks to plants, animals, or humans. Biological materials of greater concern may include, for example, infectious agents; human blood, cells, cell lines, or derived tissues; recombinant genomic materials; select agents and biotoxins; and certain animals, plants, or soils.

The requirements and controls needed to use these biological agents and materials are consolidated in Chapter 26 (*Biosafety*) of PUB-3000, and the Web-based Program description and *Biosafety Manual*. These requirements and controls are based on federal and state government, contract, and funding biosafety standards and regulations that are adopted into the ES&H Standards or implementation assumptions. Standards and regulations include, for example, OSHA Bloodborne Pathogens Standard, National Institutes of Health (NIH) Guidelines for Research Involving Recombinant DNA Molecules, Centers for Disease Control (CDC)-NIH Biosafety in Microbiological and Biomedical Laboratories, select agent regulations, and the DOE Worker Health and Safety Program.

Line management and researchers are expected to define, evaluate, control, and authorize their biological work. This is accomplished with the assistance and oversight of the Institutional Biosafety Committee (IBC), EH&S Division, and division line management and ES&H personnel. The biological work review, documentation, and authorization process is used to facilitate and document the above process. Additional duties, roles, and responsibilities are defined in PUB-3000, the *Biosafety Manual*, Division ISM plans, and operation-specific biological use documentation.

5.3.7 Occupational Safety Group

The Occupational Safety Group provides safety engineering and occupational safety services to support the Lab's mission. This includes injury-prevention and loss-control systems for customer service and technical consultation to achieve Integrated Safety Management. The Group provides the technical support required for administration of the ES&H Standards Set, ISMS *Management Plan*, PUB-3000, and the *Worker Safety and Health Program*. Core program functions provided to support the Division and the Laboratory include accident investigation services; injury and Illness recordkeeping and reporting; and noncompliance/deficiency tracking, evaluation, and funding.

The Group’s technical occupational safety focus is on preventing injury resulting from acute trauma, usually from failure or misuse of engineered systems. It provides comprehensive technical safety support including electrical safety, construction safety, shop safety, fall protection, contractor safety, seismic safety, accident investigation, transportation safety, machine guarding, material handling safety, and ergonomics.

Duties, roles, and responsibilities of all LBNL personnel and staff in achieving the expectations of the Occupational Safety Group are found in PUB-3000 (Chapter 5). Technical program descriptions are found in PUB-3000 Chapters 8, 10, 17, 18, 19, 23, 25, 27, and 28.

5.3.7.1 Worker Safety and Health Program

Title 10 of the Code of Federal Regulations (CFR), Part 851 (10CFR851), *Worker Safety and Health Program*, requires DOE sites to establish a worker protection program that will reduce or prevent the potential for injuries, illnesses, and accidental losses by providing workers with a safe and healthful workplace. The LBNL *Worker Safety and Health Program* (PUB-3851) describes the *Worker Safety and Health Program* (WSHP) that has been developed at LBNL to comply with 10CFR851. The Program includes the regulations and standards specifically required by 10CFR851, and elements of the LBNL ISMS.

The worker safety and health standards and regulations required by 10CFR851 have been adopted by the ES&H Standards process and flowed down through PUB-3000. Provisions for the review of subcontractor activities "at any tier" have also been developed and implemented through this mechanism. An element of the WHSP is to review weekly those items reported through the Corrective Action Tracking System (CATS), and evaluate them for noncompliance with 10CFR851 requirements. Identified noncompliances are then screened to determine if they meet the thresholds for reporting to DOE through the Noncompliance Tracking System operated in conjunction with the Price-Anderson Amendments Act enforcement process of the DOE Office of Enforcement.

5.3.8 EH&S Division Liaisons

EH&S Division liaisons are designated for each assigned Laboratory division or Laboratory facility. They provide a convenient, single EH&S Division point of contact between a customer division (typically via the division safety coordinator and the EH&S Division), and function as troubleshooters and problem-resolution facilitators. This relationship does not preclude any Laboratory employee from directly approaching an EH&S Division professional/subject matter expert to address a particular issue or need. The EH&S Division liaison serves as the designated point of contact to assigned divisions or Laboratory facilities. They respond to division personnel requests that the appropriate technical support be provided to implement and interpret Laboratory ES&H policies. They are required to know the customer division's work activities, personnel, and associated hazards, and assist in hazard identification and the development of controls appropriate to the hazard and work being performed.

The complete list of the duties, roles, and responsibilities of the EH&S Division liaison is delineated in PUB-3000, Section 1.3.2.10 (*EH&S Division Liaisons*).

5.4 Division Safety Coordinators

Division safety coordinators (DSCs) report directly to their division directors or deputies. The DSC is responsible for administering the division's ES&H program. Their duties include supporting division line managers or work leads in the execution of their safety responsibilities. They help integrate safety into all work activities and promote a safety culture where everyone takes responsibility for personal safety and looks out for the safety of others. They serve as a point of contact for all division staff regarding the implementation and interpretation of ES&H policies, procedures, and programs. They serve as a member of their division safety committee (or equivalent organization). They are typically responsible for maintenance of their division's ISM *Implementation Plan*.

The complete list of the duties, roles, and responsibilities of DSCs is available in PUB-3000 (Section 1.3.2.9, *Division Safety Coordinators*).

5.5 Safety Advisory Committee

5.5.1 Function

The Safety Advisory Committee (SAC) makes recommendations to the EH&S Division Director on the development and implementation of Environment, Safety, and Health (ES&H) policy, guidelines, codes, and regulatory interpretation. It conducts reviews of special safety problems, and provides recommendations for possible solutions to the Laboratory Director, Associate Laboratory Director for Operations (ALDO)/Chief Operating Officer (COO), and/or the EH&S Division Director, as requested. The SAC also provides advice and counsel to the ALDO/COO by reviewing appeals from Laboratory divisions when any division and the EH&S Division do not agree on the interpretation or application of criteria, rules, or procedures. Such advice and counsel may include options for a resolution.

In addition, the SAC Chair, in cooperation with the Office of Contract Assurance, is responsible for scheduling and conducting the portion of institutional self-assessment known as Management of Environment, Safety, and Health (MESH) reviews. These reviews are designed to ensure management systems consistent with Integrated Safety Management (ISM) are in place in all Laboratory divisions and that these systems are leading to the effective implementation of the Laboratory's ES&H program. MESH reviews are normally conducted triennially by each Laboratory division and a SAC subcommittee. Depending on the MESH review results and a Laboratory division’s response to them, the SAC will have the option to recommend changing the interval of the next review by one year. All members of the SAC are expected to serve on MESH subcommittees. MESH review results will be submitted directly to the Laboratory Director.

The SAC Chair may appoint expert subcommittees to address specific health and safety matters. Such subcommittees may become long-standing expert subcommittees, or they may be of short duration, depending upon the technical support requirement.

5.5.2 Membership/Composition

The Laboratory Director appoints the SAC Chair. SAC membership includes a representative from every Laboratory division. Division directors nominate members of their organizations to the Laboratory Director, who formally appoints them to the SAC. Appointments are normally three-year renewable terms.

As resources for the SAC, the EH&S Division Director or Division Deputy will also attend SAC meetings. Other individuals may be invited by the Chair to attend.

5.5.3 Membership Qualifications

The SAC is designed to be primarily a committee of peers involved in the Laboratory's research and development activities. In research-oriented divisions, members are expected to be drawn from research staff. There are no specific qualifications for SAC members in terms of their position, experience, and training at the Laboratory; however, since the SAC is involved in advising senior management on Laboratory policy as described above, an individual who can effectively represent his or her division should be nominated.

SAC members are expected to:

- Possess an understanding of ISM;
- Communicate regularly with senior division management and other division personnel as needed;
- Possess communication skills to comment on, make suggestions or recommendations for, revise, advise senior management on, and influence the Laboratory's approaches, methods, documents, and practices to continuously improve the Laboratory's safety programs;
- Develop an understanding of the LBNL *Health and Safety Manual* (PUB-3000) and related documents, and the processes for revising these documents.

The duties, roles, and responsibilities of the SAC are delineated in PUB-3000, Section 1.3.2.11.6 (*Safety Advisory Committee*). Their activities are described in detail on their Web site:

http://www.lbl.gov/ehs/sac/index.shtml

5.6 Radiation Safety Committee

The LBNL Radiation Safety Committee (RSC) is appointed by, and reports to, the Laboratory Director and is responsible for advising LBNL management on all matters related to occupational and environmental radiation safety. The RSC reviews and recommends approval of radiation safety policies and guides the EH&S Division and radiation user divisions in carrying out these programs. The scope of its actions generally is in issues of broad institutional concern and impact, or areas of potential high consequence either in terms of safety or institutional needs.

The RSC provides a forum to ensure that important radiation safety issues receive appropriate, balanced, and expert review before being acted upon.

The RSC is composed of not more than 10 nor fewer than five members exclusive of ex-officio members. Members are appointed by the Laboratory Director for three-year renewable terms on the basis of knowledge of the principles and practices of the control of radiation hazards and on experience and management in the use of radioisotopes and/or radiation-producing machines. The membership reflects the diversity of scientific disciplines using radiation at LBNL. The LBNL Radiological Control Manager (RCM) serves as a full member and acts as the liaison with other

Berkeley Lab programs. In addition, the LBNL SAC provides at least one full or ex-officio member who provides liaison to that body to ensure integration with larger institutional safety issues.

The duties, roles, and responsibilities of the RSC are delineated in detail on their Web site:

http://ehswprod.lbl.gov/rpg/charter.shtml

5.7 Institutional Biosafety Committee

The Laboratory requires maintenance of a qualified Institutional Biosafety Committee (IBC) to perform key biosafety functions as required by and in accordance with this charter and the NIH, CDC, DOE, and LBNL standards.

The IBC is responsible for oversight, administration, and review of Berkeley Laboratory policies and projects involving research with biological materials that may pose safety, health, or environmental risks. The IBC reports to the Laboratory Director to provide institutional assurance that research is conducted safely. To this end, the IBC assists and advises researchers and line managers in meeting their responsibilities to ensure that the biological aspects of the research are conducted in a safe manner using established biosafety standards, principles and functions of ISM, and work authorization (e.g., PUB-3000, Chapter 6). Safe research includes worker safety, public health, agricultural and environmental protection, ethics, and compliance with applicable biosafety standards and LBNL policies. A graded process is used to define, document, review, and approve biological work and controls as detailed in PUB-3000, Chapter 26. This process involves IBC approval and line management authorization of biological work.

5.7.1 Functions of the IBC

The Functions of the IBC include:

- Administering a program to review, approve, and monitor all LBNL research projects involving biological materials that may pose differing levels of safety, health, or environmental risk to plants, animals, or humans. The goal of this program is to ensure work is conducted in a safe manner.

In this program, the IBC performs initial and periodic review and approval of required project biosafety documentation that demonstrates the work will be conducted in a safe manner. Researchers and line managers are responsible for identifying and submitting project

documentation to the IBC prior to performing biological work and periodically thereafter. The IBC's review includes:

- Assessment of the containment levels, facilities, procedures, practices, training, and expertise of personnel involved in the proposed research and in comparison to biosafety standards;
- Concurrence or approval of research projects that have adequate controls and conform to the biosafety standards;
- Notifying the Principal Investigator of the results of the IBC's review or approval;
- Serving as a forum to review, make recommendations to appropriate stakeholders, and raise awareness related to biosafety concerns, institutional needs, emerging biosafety issues, and new biosafety requirements;
- Reviewing and approving LBNL biosafety policies, and making recommendations to the Laboratory Director on strategic biosafety matters;
- Review and adoption of LBNL emergency plans covering accidental spills and personnel contamination resulting from research and development activities with potentially hazardous biological materials. Site safeguards and security plans for biological etiologic agents (i.e., human pathogens) will also be reviewed.
- Coordination of LBNL response to inquiry from the public or external entities related to the IBC;
- Review of violations or incidents to determine level of significance and required reporting. Investigating and reporting any significant problems with or violations of the NIH guidelines and any significant research-related accidents or illnesses involving recombinant genomic materials to line management, the Biosafety Officer, the Laboratory Director, and the NIH Office of Biotechnology Activities (OBA) within 30 days, unless the IBC determines that the Principal Investigator or lead researcher has already filed a report;
- Submitting an annual report to the Laboratory Director that includes a roster of IBC members, member roles, and a report of significant IBC and Biosafety Program activities;
- Submitting an annual report to NIH OBA that includes a roster of IBC members, member roles, and biographical sketches of each member;
- Maintaining reviews, minutes, and reports in an orderly and retrievable fashion.

The duties, roles, and responsibilities of the IBC are delineated in PUB-3000, Section 26.4.2 *Institutional Biosafety Committee* and Chapter 26, Appendix C. Their activities are described in detail on their Web site:

http://www.lbl.gov/ehs/biosafety/bioSafetyCommittee.pdf

5.8 Environmental Management System Implementation (Core) Team

The EMS Core Team designs, implements, and maintains an EMS to help control environmental compliance concerns and to develop environmental programs to assure that adequate operational controls are in place that provide continual improvement in the reduction of environmental impacts and promotion of environmental stewardship. The EMS Program Manager convenes meetings; leads the team through design, implementation, and ongoing use of EMS; and serves as the main liaison between the EMS Core Team and LBNL executive management. The EMS Core Team meets regularly to:

- Provide Core Team training on EMS-related activities;
- Identify environmental impacts;
- Determine which environmental impacts;
- Discuss objectives and targets;
- Monitor progress toward improving environmental performance;
- Review Environmental Management Programs, which are specific programs intended to reduce activities with significant environmental impacts;
- Review findings from assessments, audits, and reviews and determine appropriate corrective actions;
- Work together—the EMS Program Manager and Core Team members—to support executive management in the Management Review process and to keep executive management apprised of:
    - New issues or changes in the Environmental Management Programs;
    - Changes in operational controls needed to implement new issues or changes in Environmental Management Programs;
    - Funding needs to implement new issues or changes in the Environmental Management Programs.

5.9 The Office of Contract Assurance

The Office of Contract Assurance (OCA) provides oversight of LBNL's management systems and operating processes to ensure that compliance, operational support for science, best management practices, and continuous improvement are achieved at LBNL. The OCA is a fully independent and internal assurance organization, and is authorized to have unrestricted access to personnel, records, and other information sources necessary to carry out its duties.

At the direction of the Director of Institutional Assurance, the OCA coordinates independent third-party reviews in areas of business, finance, operations, ES&H, as well as other selected areas. The OCA will oversee all LBNL operations and business systems using an internal

control system, which is designed to assure UC and LBNL management that operations are effective and efficient, financial reporting is reliable, and both are in compliance with applicable laws and regulations.

The OCA interfaces with EH&S Division and the SAC in managing, coordinating, and supporting ES&H assurance activities, in particular the Division Self Assessment Program; MESH reviews; the ES&H Technical Assurance Program; and independent audits of technical programs as needed. The OCA also provides technical support to the EH&S Division Director for developing ES&H performance objectives and criteria for division self-assessments, ES&H technical assurance, and DOE Contract 31, Appendix B self-assessments (see RPM Section 8.01).

5.9.1 Issues Management Program

The OCA is responsible for the LBNL Issues Management Program (IMP). The IMP encompasses the continuous monitoring of work programs, performance, and safety to promptly identify issues to determine their risk, significance, and causes, and to identify and effectively implement corrective actions to ensure successful resolution and to prevent the same or similar problems from occurring.

This comprehensive institutional program comprises four program manuals, two databases, and two implementing procedures. These tools define and implement the process for issues identification, tracking, resolution, closure, validation, and effectiveness of corrective actions. Issues that are governed by this program include program and performance deficiencies or nonconformances that may be identified through employee discovery, internal or external oversight assessment findings, suggested process improvements, and associated actions that require formal corrective action. Issues may also be identified in and/or may result in Root Cause Analysis reports, Price-Anderson Amendments Act reports, Occurrence Reporting and Processing System reports, Accident Investigation reports, assessment reports, and External Oversight reports.

Analysis of issues, individually and collectively, is performed in order to identify programmatic or system issues, and to identify recurrence of issues, generic issues, trends, and vulnerabilities at a lower level before significant problems result.

Lessons Learned and Best Practices, based on LBNL's and other facilities' operating experiences, are developed to ensure ongoing improvement of safety and reliability, to prevent the recurrence of significant adverse events/trends, and to determine implementation strategies that will help LBNL successfully meet the missions and goals set forth by the DOE.

Many of the issues and concerns of the IMP are safety related. Therefore, OCA interfaces with the EH&S Division in managing, coordinating, and supporting ES&H assurance activities, in particular the Division Self Assessment Program, MESH reviews, the ES&H Technical Assurance Program, and independent audits of technical programs as needed. The Office also provides technical support to the EH&S Division Director for developing ES&H performance objectives and criteria for division self-assessments, ES&H technical assurance, and DOE Contract 31, Appendix B, *Self-Assessments* (see RPM Section 8.01).

5.9.2 Requirements Management Program

The OCA is responsible for the Requirements Management Program, which plans, develops, implements, and manages the LBNL requirements management process in support of institutional prime contract administration, and integrating this process with existing LBNL operating and business processes. This program addresses ES&H requirements along with any other external requirements. Additional responsibilities include facilitating expedient applicability review and impact assessment of new and modified contractual and regulatory requirements as well as collaborating with line management to integrate new and revised requirements into existing operating and business processes.

5.9.3 Conduct of Operations

The OCA provides institutional oversight and manages the Conduct of Operations Program. Divisions will implement the requirements outlined within the *Conduct of Operations Program Manual*, which will be published in late 2009.

Conduct of Operations is applied using a graded approach that takes into consideration a number of aspects, including relative importance to safety, safeguards and security; magnitude of hazard involved; life-cycle stage of a facility; programmatic mission of a facility; particular characteristics of a facility; and other relevant factors.

LBNL uses an integrated management systems approach to implementing the Conduct of Operations Program. The Conduct of Operations Program complements and is integrated to the maximum extent possible with DOE O 226.1A, *Implementation of Department of Energy Oversight Policy*; DOE O 414.1C, *Quality Assurance*; and DOE P 450.4, *Safety Management System Policy*. For the Conduct of Operations program to be successful, feedback and improvement methods must be effectively implemented.

5.10 Interface with UC Berkeley ES&H Department

For work carried out in LBNL and UC Berkeley spaces, a Partnership Agreement has been renewed that clarifies responsibilities and oversight of safety requirements. Although the UC Berkeley campus and Berkeley Laboratory safety systems and procedures differ, they are consistent with the principles of integrated safety management and provide equivalent protection.[6]

The UC Berkeley safety system governs LBNL-funded activities in campus spaces exclusive of the Donner laboratory facilities. LBNL principal investigators have an obligation to Berkeley Laboratory line management to provide a safe workplace on campus for all LBNL-sponsored work by complying with the UC Berkeley safety system. The LBNL safety system governs work in LBNL spaces, which include Donner and Calvin laboratories.

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6.0 ES&H Management System Mechanisms

6.1 Introduction

This section identifies the set of core Integrated Safety Management System (ISMS) requirements applicable to all LBNL organizations, provides the foundation for Environment, Safety, and Health (ES&H) management at LBNL, and includes the necessary detail required for implementation of ISMS directly and through other LBNL documents, including division-specific ISM *Implementation Plans* (see Appendix A). This ISM *Management Plan*, PUB-3000, the Division ISM *Implementation Plans* and the *Environmental Management System* (EMS) *Plan* are the principal mechanisms for implementing ISMS and EMS at LBNL. These four facets, complemented by assessment and assurance, provide a structure to ensure work is performed safely and in compliance with applicable ES&H requirements consistent with the graded approach. The primary focus of the ISMS is to provide the worker with a safe work environment, ensure that necessary resources are made available to perform the work, and establish requirements for adequate procedures and controls to ensure that work is performed safely while minimizing environmental impacts. The ES&H roles, responsibilities, and authorities described in this section are developed and practiced to drive the integration of safety into all work activities. The objective of this effort is for the ES&H Management System to be completely integrated within the Laboratory's work and business processes.

Planning the work activity is the starting point for analyzing and understanding hazards, identifying environmental impacts, and determining specific ES&H requirements and controls (referred to as operational controls, an element of the EMS plan). Figure 6.1 illustrates that work conducted safely while minimizing environmental impacts is accomplished by following the seven ISMS Guiding Principles while applying the five Core Functions discussed in Section 4 in the Institution/Facility/Activity Process. It also shows the three levels of management requirements nested around accomplishment of the work activity. During the planning process, priorities are balanced with resources and constraints to maximize the likelihood of a successful outcome for the work activity envisioned. The results of the work process are analyzed for potential improvements throughout work planning and completion phases, and after the work is finished in an ongoing process.

A work activity must satisfy requirements and constraints based on its defined work scope, hazard, and environmental impact analysis, and the applicable controls established by the institution and the facility where the activity is conducted. The institutional requirements presented in this *Management Plan* and PUB-3000 are used to ensure Laboratory-wide consistency. Similarly, a division or facility may establish a required practice, constraint, or limit to ensure consistency and compatibility of operations within a facility. Information gained from evaluations of the work—operational results, worker suggestions, self-assessments, audits, and so forth—is used as feedback to adjust and improve requirements and controls at the work activity, facility, and institutional levels.

This section describes how the seven ISMS Guiding Principles and five Core Functions at the Institution, Division/Facility, Line Management/Activity (e.g., work lead), and individual levels are aligned and nested within one another and become broader or more specific as one looks up or down the management chain. It also describes how the seven Principles and five Functions are interwoven during the planning, execution, and evaluation of work activities from the institutional down through the individual level.

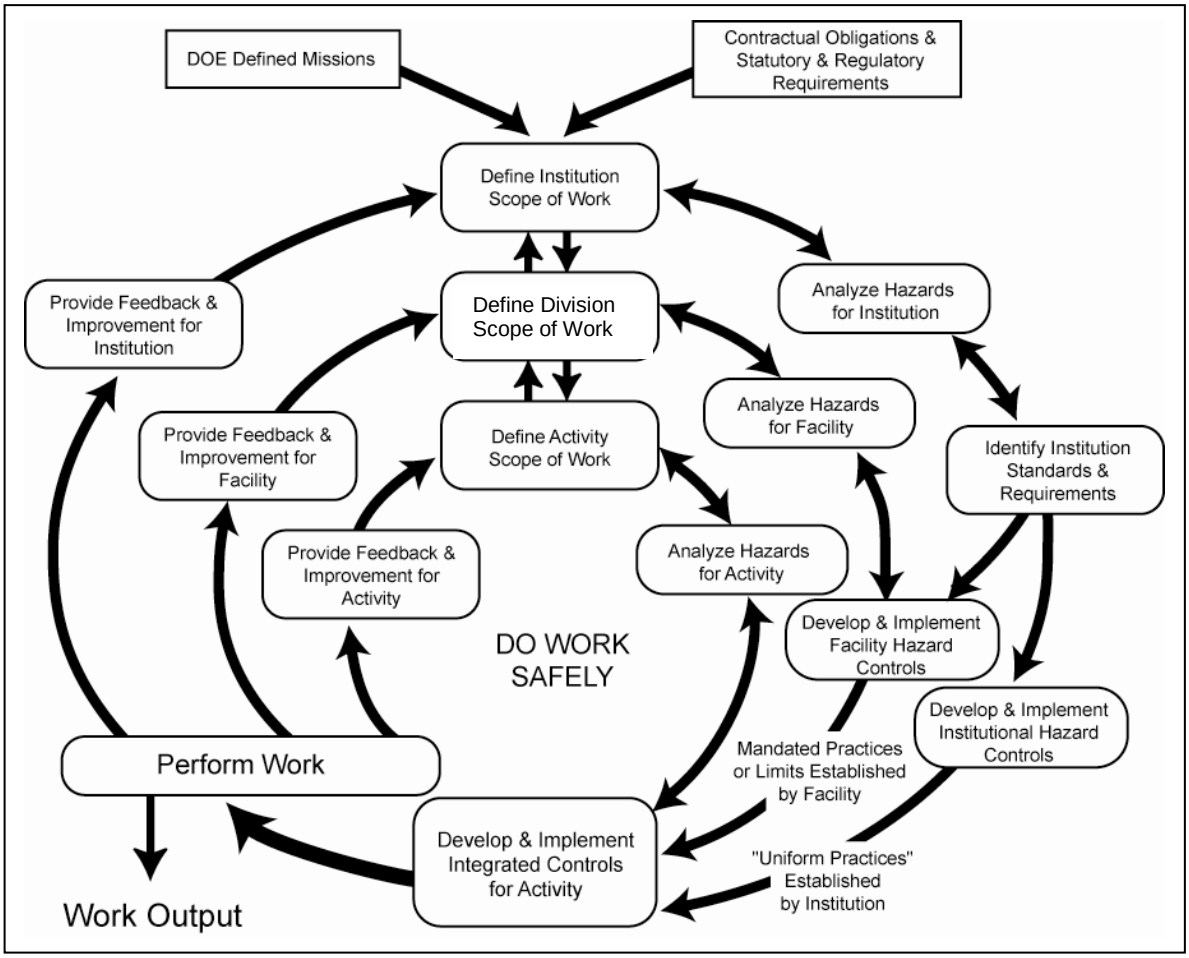

Figure 6.1 Institution/Facility/Activity ISMS Work Cycle Structure for LBNL

6.2 Roles and Responsibilities

6.2.1 ISMS Guiding Principle 1—Line Management Responsibility for Safety

Line management is responsible for the ES&H system and is ultimately responsible for ES&H at the Laboratory. To meet the goal of integrating safety into all work and workplaces, line management must provide an unbroken linkage of management personnel for direction, operations, performance, and effectiveness. Line managers are individual managers in that linkage, with specific leadership responsibilities for work and job tasks, including safety. To

achieve such a linkage at LBNL poses unique and special challenges to meeting the principles of ISM. For example:

> Postdoctoral scholars may oversee, direct, and assign tasks to co-workers, yet are not permanent employees or recognized by law as supervisors.
>
> Groups visiting LBNL to use research facilities must incorporate safety considerations into the conduct of their work on-site and, in order to meet the principles of ISM, must ensure that the management linkage is intact and includes the lead of the group and each worker.

LBNL has developed the "safety line manager" and "work lead" concepts to address this challenge to rigorous implementation of ISM (see Glossary, PUB 3000, Chapter 1). Staff members who are not line managers or supervisors as defined in the RPM, Section 2.19, but who have been authorized by their supervisors to direct, train, and assign tasks to others are accountable for the safety of those under their direction as a work lead. This group includes, for example, senior postdoctoral staff and visiting project leaders. Because these individuals derive their work and thereby their safety responsibilities from designated supervisors, the supervisor in these cases is ultimately responsible for adherence to EH&S Division policies and safe work practices. "Safety line manager" is a generic term for individuals directly responsible for an operation, activity, or group of activities. The safety line manager may be at any level within the organization and is formally identified by the activity's authorizing individual. In most cases, the safety line manager will be directing the work of others as part of the operation or activity.

6.2.1.1 Line Managers Are Responsible for Participating in the ES&H System as Guided by Their Expectations, Roles, and Responsibilities

1) ES&H expectations, roles, and responsibilities are to be established for each employee, including supervisors and managers. Using the Performance Review Document (PRD) process, expectations are to be documented and communicated, and the employee given the opportunity to provide feedback.

2) A substantive ES&H performance assessment addressing expectations and accomplishments is to be included in each individual's performance appraisal. For managers and supervisors, the appraisal is also to address performance in establishing and implementing ES&H processes. Refer to Appendix B.

3) ES&H responsibilities and ES&H performance are to be explicit considerations during the annual performance evaluation process and important factors in determining salary actions and promotions.

4) Each division, as part of its ISM *Implementation Plan*, must describe in detail how the issue of safety supervision is to be addressed. The need is recognized for diverse solutions across the Laboratory due to differences including type of staffing, number and type of guests, and the existing systems for integration of safety into the management structure. One aim of developing the division ISM *Implementation Plans* is to present policies and

processes that effectively address this challenge. Determining the effectiveness of each division in meeting this aim is part of the self-assessment process.

6.2.1.2 Workers Are Responsible for Participating in the Development of the ES&H System and for Working According to Established Laboratory Processes/Procedures as Guided by the Expectations, Roles, and Responsibilities Assigned to Them by Line Management

Each worker, supervisor, and manager is directly responsible for ensuring his or her own safety and looking after coworkers while providing responsible stewardship of the environmental resources in his or her care, and promoting a safe, healthful, and environmentally sound workplace and community. It must be recognized that not all individuals functioning as work leads at LBNL are formally recognized as supervisors or managers as defined in the *Regulations and Procedures Manual*. Nonetheless, LBNL policy makes clear that work leads have distinct responsibilities for management of safety in their work areas.

1) The Laboratory's goal is to practice ES&H by taking actions to avoid the potential for injury to people or damage to property, and to provide responsible stewardship of the environmental resources in its care. The principal means of instilling responsibility and enforcing accountability for ES&H are:

   a) Communicating ES&H expectations to employees;

   b) Reinforcing expectations through timely verbal feedback;

   c) Involving workers in policy and procedure development, work planning, hazard control, and continuous self-improvement (such as division assessment activities);

   d) Formal appraisal and salary actions implemented annually for each employee;

   e) Awards and recognition for notable contributions to ES&H;

   f) Corrective action in cases where ES&H system performance or individual performance does not met expectations.

2) Feedback and corrective action for individual performance not meeting expectations will be taken consistent with Laboratory personnel policies and procedures for violations of Laboratory ES&H requirements.

3) Feedback and corrective action when the ES&H system does not meet expectations, such as the occurrence of an incident or a systemic failure, requires the organization authorizing the work to perform an investigation of the relevant circumstances or to assist DOE investigators in conducting a review that falls within their purview. The investigation will involve the appropriate subject matter experts (SMEs), certified root-cause analysts, and workers. Necessary changes are to be made to the relevant policies, procedures, or hardware based on the findings of the authorizing organization's review.

4) Accountability applies to all levels of employees, including managers and supervisors. It calls for positive reinforcement for meeting Laboratory ES&H expectations and negative consequences for failing to do so. The management of each division is responsible for having in place effective processes to implement, measure, and reinforce Laboratory ES&H expectations. Each division is to use its division awards and recognition program to promote exemplary ES&H behavior and performance.

5) Each division will hold its employees accountable for compliance with Laboratory ES&H requirements through personnel processes such as performance appraisals, salary-management actions, awards and recognition, and the application of corrective action. In addition:

   a) Each worker, immediate supervisor, and manager is directly responsible for ensuring that accidents and injuries are properly reported. Accurate and complete reporting is necessary.

   b) All employees are responsible for bringing ES&H concerns promptly to the attention of the appropriate manager or supervisor for resolution. If a satisfactory response is not received, the senior manager for the organization should be contacted, followed by the EH&S Division Director.

6) Each employee is directly responsible for ensuring his or her own safety, the safety of others, and minimizing the environmental impacts of his or her actions. Individuals are responsible for following all ES&H work instructions, including signs, procedures, Job Hazard Analyses (JHAs), and workers' aids. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions. All members of the workforce are held accountable for meeting the Laboratory's ES&H requirements as defined in this *Management Plan*, the ES&H Standards Set in Contract 31, and as specified in PUB-3000 and other work instructions.

6.2.2 ISMS Guiding Principle 2—Clear Roles and Responsibilities

Clear roles and responsibilities are established and maintained.

6.2.2.1 ES&H Roles, Responsibilities, and Authorities (RRAs) for Organizations and Individuals Are Clearly Defined

1) The authorizing organization is responsible for authorizing work. Authorizing organizations are distinguished by having control of the funding as well as responsibility to the sponsor for accomplishing the programmatic mission or activity.

2) The responsibility for work authorization may be delegated to another organization along with the funds to accomplish a specific work element. All delegations of work-authorization responsibility must be formally documented and approved by the management of each division involved. Irrespective of the number or level of work authorization delegations, the

program organization retains ultimate responsibility back to the sponsor for the conduct of the work.

3) Work performed as services by one organization for another is an area of particular concern requiring special attention. The appropriate division of ES&H Roles, Responsibilities, and Authorities (RRAs) between requesting and service-providing organizations must be clearly defined.

4) The authorizing organization is responsible for the activity's conduct, including accomplishing the technical objectives and ES&H requirements within the defined budget. The individuals responsible for: (a) authorizing the work activity; (b) validating that the proposed work falls within the established ES&H envelopes (i.e., facility or operational concurrence); and (c) supervising the specific work (i.e., ensuring work requirements are met) must be clearly identified and their ES&H RRAs clearly defined.

5) The individual supervising work is responsible for identifying the job assignments that have specific ES&H RRAs and assuring that they are clearly defined. This may be documented in ES&H documents [e.g., PUB-3000*,* Acitivity Hazard Documents (AHDs), Radiological Work Authorizations (RWAs), JHAs, or in division-specific documents]. This information is to be provided to the individual performing the work and to be readily accessible to others who should be aware of the ES&H RRAs.

6) Each division director is responsible for identifying a building manager for each facility to fulfill responsibilities identified in PUB-3000 and PUB-541.

7) Each division is to have a division safety coordinator to provide independent oversight of the division's organizations, facilities, and activities to assure the proper implementation of the ES&H program. In this context, "independent" means that the division safety coordinator is not in the direct line of authorization or management of the activities being evaluated. When this condition is not met, there shall be a separate independent evaluation of the activity to eliminate any potential conflict of interest.

8) LBNL's EH&S Division is responsible for supporting the management chain by participating in work activity planning, monitoring operations for compliance, and providing the information needed to the appropriate staff and management to help maintain a safe work environment, while minimizing environmental impacts.

6.2.2.2 The Management Chain Is Defined for Each Work Activity So Roles and Responsibilities Are Clear

1) For each work activity, the individuals serving in the management chain (i.e., first-level work lead up to the responsible division director) are to be identified by the organization authorizing the work. The management chain has direct control over the funding for the work activity. Each division ISM Plan must describe the management chains and relationships used to manage the division. The work lead and first-line supervisors are key individuals in the structure; they must know their people, the work, and the structure both up and down as well as across the structure. Safety documentation must, at a minimum,

specify the work lead, safety line manager, and division director. Additional names should be added if they are key to the allocation of ES&H resources or ES&H reporting.

2) The management chain is responsible for: (a) defining the scope of work; (b) ensuring that the hazard and environmental impact control system is effectively implemented; (c) ensuring that workers have the skills, knowledge, and abilities (SKAs) to initially evaluate the hazards and identify the environmental impacts associated with an activity; (d) ensuring that workers have the SKAs, including physical capabilities, to perform the assigned work safely while minimizing environmental impacts; (e) authorizing the defined work, subject to the appropriate controls; (f) ensuring that the workers perform the work safely while minimizing environmental impacts and in conformance with applicable institutional, facility, and activity controls; (g) monitoring and, as appropriate, strengthening the work activity's ES&H performance; and (h) soliciting worker input.

6.2.2.3 LBNL's Commitment to Safety and Stewardship of the Environment through the ISMS and EMS Is Extended to Subcontractors and Subcontract Employees for Whom LBNL Has ES&H Responsibility by Describing Clear Roles and Responsibilities

1) To ensure the Laboratory's commitment to safety and stewardship of the environment, ISMS and EMS concepts are extended to all of its service subcontractors, lower-tier service subcontractors, and their employees, including construction subcontractors. Additionally, ES&H requirements are to be incorporated into the subcontracts, as appropriate, and flowed down to the lower-tier subcontractors as appropriate. The subcontractors are responsible for the flow-down of ES&H requirements to their lower-tier subcontractors and the ES&H interactions with them.

2) Those activities identified on the Designated Commercial Services List are determined to be noncomplex and nonhazardous when performed in a work location having only negligible hazards present. Noncomplex and nonhazardous tasks are excluded from the ISM contractual flow-down requirements. The Designated Commercial Services List can be found at the following Web address:

http://procurement.lbl.gov/SubcontractorSafetyGuide.pdf

3) An ES&H specialist (usually from the EH&S Division) determines the selection of appropriate subcontractor ES&H requirements to ensure that subcontractor ES&H procedures appropriately meet Laboratory standards. All appropriate hazards and environmental impacts are to be communicated between the Laboratory and the service subcontractor. Hazards and environmental impacts to be communicated include the Laboratory's work activity and facility work area hazards, and the subcontractor's work-activity hazards and environmental impacts. Divisions may also establish procedures specific to their requirements.

4) The subcontract ES&H requirements are to be consistent with the flow-down requirements of Contract 31, Clause I.86, and this *Management Plan*. The Procurement and Property

Management Department (Procurement) is to use Contract 31, *Management Plan* requirements, and the subcontractor ES&H requirement determination to select the appropriate subcontractor-ES&H requirements according to Procurement procedures.

5) The organization requesting a subcontract for work is to evaluate the planned subcontract work using the LBNL e-Procurement Requisition Worksheet process as described in the *Guide for On-Site Subcontractor Safety Plans*. The appropriate ES&H SME can assist the requesting organization. The appropriate ES&H SME is to be notified of all requests for a subcontract where the work is categorized as complex or hazardous. Subcontractor interaction on the development of their hazards, environmental impacts, and controls may be necessary and can be facilitated through use of a Safety Plan or Safety Checklist.

6) The subcontractor is to be informed of the applicable Laboratory location hazards and environmental impacts for the work activity. The subcontractor must also obtain the appropriate training as determined by the ES&H SME.

7) A subcontractor performing work categorized as complex or hazardous is required to manage and perform the work according to the subcontractor's ES&H management system, which, at a minimum, must fulfill the requirements of Contract 31, Clause I.86, and be available for Laboratory review through Procurement. In addition, at the determination of the ES&H SME, a subcontractor may be required to provide a site- and/or job-specific ES&H plan based on its ES&H management system. Procurement is to obtain this plan. The requesting organization and the appropriate ES&H SME are to review it for operational and technical accuracy and completeness. Then, together with Procurement, they provide the approval through Procurement process.

8) Employees of another DOE facility in which work is performed under an approved ISM program (e.g., Argonne National Laboratory, Brookhaven National Laboratory) should be treated as LBNL workers regarding ES&H matters when working at LBNL. Such employees are required to satisfy all Laboratory ES&H requirements specified in applicable Laboratory ES&H documentation [e.g., JHAs, Job Hazard Questionnaires (JHQS), AHDs] when performing services for the Laboratory. However, LBNL may give equivalencies for training provided by their employers.

6.2.2.4 ES&H Documents Are Written with Worker and Stakeholder Participation So That They Are Readily Understandable by the Individuals Performing and Managing the Work, Including Clear Roles and Responsibilities

1) The purpose of the Laboratory's ES&H documents (i.e., manuals, plans, and procedures) is to enable all employees, subcontractors, guests and visitors to work safely while minimizing environmental impacts.

2) The authors and approving organizations of ES&H documents are responsible for ensuring that instructions are workable and readily understandable to the individuals performing and managing the work. The authors are responsible for ensuring the participation of appropriate workers in the development of ES&H documents that affect them. The authors

and approving organizations are likewise responsible for ensuring that ES&H documents are consistent with applicable rules and requirements.

3) The resulting ES&H documents are to be readily available to all individuals who need access to the information. Work instructions should contain the information needed to perform the work safely. When describing hazards and specifying controls, instructions should minimize references to documents not readily available at the worksite.

4) In situations where requirements are particularly complex or ambiguous, the organization authorizing the work is to use the appropriate ES&H professionals and other SMEs to interpret and assist in developing ways to satisfy requirements. Workers who will be performing the work should be consulted during development to verify that the resulting instructions make sense.

5) Workers are strongly encouraged to be actively involved in the development of operating procedures specific to their work activities.

6) Individuals are responsible for following ES&H documents, as written, or having the documents changed, as required, prior to performing work.

6.2.3 ISMS Guiding Principle 3—Competence Commensurate with Responsibilities

Personnel possess competence commensurate with responsibilities.

6.2.3.1 Individuals Receive Appropriate Institutional ISMS Training

1) All Laboratory employees are to be trained in the principles and functions of ISMS and the Plan, Do, Check, and Act Concepts of the ISMS and EMS plans at a level appropriate for their specific job duties and responsibilities. The Laboratory is responsible for developing the institutional ISMS training courses such as ESH 10, *Introduction to Environment, Safety, and Health at LBNL*.

2) Each division is responsible for ensuring that its employees receive ISMS training, including facility- and activity-specific training as appropriate, in an effective and timely manner.

3) Each division is responsible for assuring that the required ISMS and ES&H training is appropriately documented in the JHA System, and reviewed and updated at least annually.

6.2.3.2 Individuals Receive Appropriate Job-Specific ES&H Training

1) The individual's home organization ensures base skills through the hiring process and performance review.

2) The individual supervising the work activity is responsible for ensuring that the training necessary to do the assigned work in accordance with the ES&H requirements is identified and communicated to the individual's home organization.

3) All personnel are to receive training to perform their work in a safe and environmentally responsible manner.

4) Training, with appropriate testing or evaluation, demonstrates competency to meet ES&H standards and facility- and activity-specific requirements.

5) Accomplishment of formal ES&H training is documented in the Berkeley Lab JHA Training Record System. Documentation of informal training, such as job-specific training on procedures, on-the-job training, maintenance of personal protective equipment, and so forth is the responsibility of the safety line manager and home organization supervisor and should follow the guidance given in PUB-3000, Section 24.4.8.

6) The authorizing organization is responsible for ensuring that the resources necessary for required ES&H training are provided by that organization or another appropriate organization.

7) Home organizations are to verify that their personnel have the required training.

8) The work activity safety line manager is to ensure that the personnel supporting the activities have the required ES&H training, including facility-specific training.

6.2.3.3 Individuals Are Qualified to Perform Assigned Work

1) Each individual must possess the necessary skills, knowledge, and abilities, including physical capabilities, to carry out his or her assigned tasks. The base skills are to be ensured by the home organization.

2) The individual supervising the work activity is responsible for identifying: (a) the qualifications, including appropriate medical certifications and surveillance necessary to carry out the work; and (b) the individuals with the qualifications and training to perform the work.

3) Each individual is responsible for completing all required training identified in his or her JHA/JHQ and maintaining necessary certifications with the cooperation and support of the management chain.

6.3 Work Planning and Prioritization

6.3.1 ISMS Core Function 1—Define the Scope of Work

6.3.1.1 The Work Activity Is Defined

1) The organization authorizing a given work activity is responsible for: (a) stating the technical objectives; (b) defining the work elements to be performed; (c) identifying the facility in which the work will take place; and (d) identifying the individual who will be supervising the work activity.

2) The management chain that results from these determinations is responsible for ensuring the work activity is properly analyzed, controlled, performed, and monitored.

6.3.1.2 The Graded Approach Process Is Consistently Applied

1) An individual may initiate and perform a work activity without the imposition of formal work controls if it involves only activities commonly performed by the public, as explained in PUB-3000. In no instance will an individual initiate or perform a work activity not commonly performed by the public without authorization of an appropriate person in the management chain. Individuals are expected to work within their job scopes and work assignments. Using the graded approach, senior researchers would be expected to have a wide range of authorization within their job scope as compared with graduate students or technicians new to a lab and in the process of developing their skills to meet their new job scope.

2) The authorizing organization is responsible for ensuring that the greater the hazards associated with an activity, the more rigorous the work-planning process required. More rigorous processes will also be required if significant environmental impacts are present. The objective of the work-planning process is to ensure the hazards and environmental impacts associated with the work activity are clearly understood and appropriately addressed. To ensure this objective is met, relevant ES&H professionals and SMEs are to be used during the work-planning process, as appropriate. These individuals provide advice on the application of PUB-3000. The detail of work instructions is tailored to the consequence of the activity and the competency of the workers.

3) Consistent with the provisions and levels described in Section 7 and PUB-3000, the safety line manager is responsible for: (a) authorizing the work activity; (b) ensuring the facility and/or operational ES&H envelope; (c) supervising the work; (d) providing ES&H support; and (e) assuring worker involvement in the analysis of hazards and environmental impacts, and in determining appropriate work controls and environmental impact controls to be applied to the work activity.

4) Work is to be authorized by the appropriate level of management as described in Section 7 of this Plan and detailed in PUB-3000, Chapters 6 and 32.

6.3.2 ISMS Guiding Principle 4—Balanced Priorities

Resource allocations are balanced, making ES&H a priority in project planning and execution.

6.3.2.1 Resource Planning Processes Ensure Balanced Priorities

1) The authorizing organization is responsible for allocating sufficient resources to ensure safe and compliant operations while minimizing environmental impacts.

2) A work activity proceeds only with a reasonable expectation by the management chain that there will be sufficient resources to ensure ES&H requirements are satisfied over the length of the project, including closeout activities.

6.4 Hazard Analysis

6.4.1 ISMS Core Function 2—Analyze the Hazards and Environmental Impacts

6.4.1.1 Hazards and Environmental Impacts Are Identified and Analyzed for All Work Activities

1) The authorizing organization is responsible for ensuring that the associated hazards and environmental impacts are identified. ES&H professionals are to be used in the hazard- and environmental-impact-identification process, as appropriate. Workers are to be provided an opportunity to participate in the process of identifying hazards and environmental impacts.

2) Hazards and environmental impacts are to be identified and analyzed consistent with the provisions of PUB-3000, Chapters 6 and 32. ES&H professionals and SMEs provide advice on the application of PUB-3000 and applicable ES&H Standards to ensure consistent implementation across LBNL.

3) Each individual is responsible for making conscious considerations of the ES&H implications of their actions whether or not formal hazards analysis, identification of environmental impacts, and their impacts and documentation are required.

6.4.1.2 Job Hazard Analysis Documents Are Developed for Appropriate Work Activities

1) The intent of the JHA is to ensure front-end identification of all hazards and environmental impacts associated with a work activity. A JHA is required when a work activity is beyond that commonly performed by the public. The organization authorizing a work activity is responsible for ensuring that a JHA is prepared, reviewed, and approved consistent with the provisions of Section 7 of this Plan, and PUB-3000 (Chapters 6 and 32). The format and instructions for the JHA are contained in PUB-3000, Chapter 32, and build upon the Work Authorization requirements found in Chapter 6. The completed JHA, with appropriate RWAs, AHDs, etc., provides the authorization for the work activity once a work review confirms readiness. The scope of a work review is tailored to the scope of the work using the graded approach and may be a simple conversation between the worker and supervisor, or it may involve a rigorous checklist prior to startup of a complicated experimental device.

6.4.1.3 Appropriate Sections of PUB-3000 Are Applied in the Process of Analyzing Hazards and Identifying Environmental Impacts

1) The specific hazards and the impacts of significant environmental aspects identified with the work activity are to be analyzed according to the requirements of PUB-3000, Chapter 6, and by the inclusion, as necessary, of the appropriate ES&H professionals.

2) The identified hazards and the impacts of the significant environmental aspects are to be clearly communicated to all involved in the activity.

3) The authorizing organization and the individual supervising the work are responsible for periodically reviewing the hazards and environmental impacts associated with the work activity as described in PUB-3000, Chapter 6.

6.5 Control and Mitigation Hazards and Environmental Impacts

6.5.1 ISMS Core Function 3—Develop and Implement Hazard and Environmental Controls

6.5.1.1 Uniform Processes Govern Development of ES&H Documents

1) Uniform requirements and processes are to be applied across the Laboratory for consistent and comprehensive completion of the ES&H documents cited in this *Management Plan*, as well as other major ES&H documents by using the provisions contained in Section 7 and PUB-3000. The described requirements and processes provide the essential conditions, content, format, and other specifics for these documents. Appropriate implementation and use of applicable ES&H Standards are to be incorporated as described in PUB-3000.

2) A uniform process is to be applied across the Laboratory for the development of ES&H and ES&H-related procedures consistent with the provisions established in PUB-3000. This process identifies when procedures are to be developed, specifies content based upon the hazards and environmental impacts being managed as well as whom to include in the initial review of new provisions, and provides a recommended format for structuring the procedure.

6.5.1.2 Requirements in PUB-3000 Are Applied in the Process of Developing and Implementing Controls

1) The individual supervising the work activity is responsible for ensuring that tailored controls are developed for each hazard associated with the work activity and to reduce the impacts of significant environmental aspects. The tailored controls or reduction of impacts including the appropriate incorporation of engineered and administrative controls are to be developed and implemented consistent with Section 7 and PUB-3000.

2) As appropriate, SMEs are to be used in development of work and environmental controls. These individuals provide advice on application of PUB-3000 and applicable ES&H Standards to specific work activities, to ensure consistent implementation across LBNL and the reduction of significant environmental impacts.

3) Workers are strongly encouraged to be actively involved in the development of operating procedures specific to their work activities.

4) The authorizing organization is responsible for approving the work and environmental controls and ensuring that appropriate and graded use of quality assurance principles and processes as described in the *Operating and Quality Management Plan* (PUB-3111) are incorporated and used.

5) The designated controls are to be clearly communicated to all associated with the activity, and whose work proximity makes it prudent that they are aware of the controls.

6) The authorizing organization and the individual supervising the work are responsible for periodically reviewing and ensuring the adequacy of the controls associated with the work activity and the effectiveness of the engineered and administrative controls incorporated.

6.5.2 ISMS Guiding Principle 5—Identification of ES&H Standards and Requirements

ES&H Standards and requirements are identified and implemented. The ES&H Standards Set provide the first tier of necessary and sufficient standards to be implemented. The basis and particulars are presented in Sections 10 and 12.

6.5.2.1 Programs for Preventing Injuries Are Defined

1) Each division is responsible for having in place defined programs to prevent injuries. An ergonomics program developed consistent with PUB-3000 is an example of a defined program to prevent injuries.

2) Each division is responsible for analyzing all the injuries associated with its organization's operations and facilities.

3) Injury and illness statistics and related information are accessible through an access-controlled database [Supervisor Accident Analysis Reporting (SAAR) Database] maintained by the EH&S Division.

4) Using resources such as the Lessons Learned program, each division is responsible for assessing whether existing practices or conditions could materially contribute to the organization's accident and injury rates.

5) Each division is responsible for developing programs to address (a) the specific injury and illness categories driving the organization's days away, restricted, transferred (DART) numbers; and (b) other practices or conditions that could materially affect the organization's accident and injury rates.

6.5.2.2 ISMS Principles and Commitments Are Addressed in ES&H Documents

1) PUB-3000 and other Laboratory ES&H documents are to address ISMS principles and commitments.

2) PUB-3000 describes the approaches the Laboratory uses to implement the ISMS and EMS. It references and implements the ES&H Standards Set as they relate to specific work, hazards, and environmental impacts.

3) The division ES&H-related documents (e.g., AHDs, Division ISMS Plans, self-assessment plans, training plans) are based on ISMS principles and incorporate the applicable requirements of the ES&H Standards Set, all per the provisions of this *Management Plan* and PUB-3000.

6.5.3 ISMS Guiding Principle 6—Hazard & Environmental Controls Tailored to Work Being Performed

Hazard and environmental controls are tailored to the project work. Consideration of controls as they apply to the workplace hazards and environmental impacts shall take into consideration regulatory requirements and the level of control needed.

6.5.3.1 Appropriate Sections of PUB-3000 Are Applied in Tailoring Controls to Specific Work Activities

The individual supervising the work activity is responsible for ensuring that tailored controls are developed and implemented for each hazard and environmental impact associated with the facility and work activity, consistent with the provisions of Section 7 and PUB-3000.

6.6 Work Authorization and Performance

6.6.1 ISMS Guiding Principle 7—Operations Authorization

Operations are authorized before work begins. Depending upon the scope, work may be authorized by line management or, in conformance with the graded approach, may require extensive review by ES&H professional staff and engineering experts, and explicit authorization by the division director. Some activities may require authorization by outside agencies. Further information regarding work authorization is provided in Section 7.0.

6.6.1.1 Work Activities Are Appropriately Reviewed and Authorized Before Starting

1) Work activities are to be reviewed and authorized before the work begins, consistent with the provisions of Section 7 and PUB-3000 (Chapter 6).

2) The safety line manager solicits worker review and comment of proposed operating plans or procedures before work is authorized.

3) The authorizing organization is responsible for ensuring an appropriate work authorization review is conducted to validate satisfaction of the ES&H requirements.

4) The scope and rigor of the work authorization review will vary based on the characteristics of the work activity. The requirements of the work authorization review process are defined in PUB-3000, Chapter 6.

5) When a person calls 7911 or 6999 for an emergency situation, the Security & Emergency Operations Group automatically becomes the authorizing organization for the emergency response, without any documentation (other than their Policies and Procedures), to respond to that incident. The Security & Emergency Operations Group is responsible for ES&H and the work practices of the response. The management of the response is handled via a unified command involving appropriate staff from this organization.

6.6.2 ISMS Core Function 4—Perform Work within Controls

6.6.2.1 Work Is Appropriately Controlled

1) Each individual is responsible for adhering to the ES&H controls established for the work activity and informing the supervisors when controls are believed to be inadequate.

2) The safety line manager is responsible for ensuring that workers understand the ES&H controls and understand that work is to be performed according to the defined work controls.

6.6.2.2 Applicable Procedures and Governing Documents Are Followed

1) The individual supervising the work is responsible for ensuring that each worker has immediate access to the work activity's governing procedures and ES&H documents.

2) Steps are taken by the individual supervising the work to ensure that each worker on the activity is knowledgeable concerning the governing procedures and work and environmental controls.

3) All work is to be performed in conformance with work instructions, including signs, AHDs, JHAs, workers' aids, and other governing documents. If the work instructions cannot be followed safely as presented, or if they present a new hazard, the employee is responsible for notifying the appropriate individuals and assisting, as appropriate, in modifying the work instructions.

6.7 Performance Monitoring and Feedback

6.7.1 ISMS Core Function 5—Provide Feedback and Continuous Improvement

6.7.1.1 Work Activities Are Monitored

1) The individual supervising the work is responsible for monitoring the work activity to ensure that the governing procedures and ES&H documents are being followed. Safety line managers observe their workers at appropriate intervals to verify that work is to be performed according to the defined ES&H work controls.

2) If there is indication that the proper limits or controls of a work activity are not being followed, the activity is to be evaluated immediately by the authorizing organization to confirm the indication. Once confirmed, the work activity shall be suspended in a controlled and safe manner, if appropriate, until remedial actions are taken.

3) In the event it is determined that the approved limits or controls of a work activity are exceeded, the affected work and/or facility is to be placed in a safe condition, and further work is to be suspended until appropriate remedial actions are taken. *Work Activity Authorization* and *Facility Operation Authorization* provisions are discussed further in Section 7 and PUB-3000 (Chapter 6).

4) Each worker is responsible for bringing to the attention of the immediate supervisor problems with the applicable limits or controls and opportunities for improvement associated with the work or governing procedures. The supervisor is responsible for the evaluation and appropriate action.

5) Each worker is empowered to stop work if there is an unsafe or unapproved condition. Prompt notification of the immediate supervisor is required. Resumption of work will not proceed until after the condition has been evaluated and the appropriate remedial actions have been taken.

6.7.1.2 ES&H Self-Assessment Programs Are Defined

1) The purpose of the Laboratory's ES&H self-assessment program is to ensure a proactive approach to ES&H and to improve ES&H performance. The specific objectives of LBNL's ES&H self-assessment program are to ensure that (a) Laboratory operations comply with applicable ES&H policies and procedures; (b) ES&H-related requirements are integrated into all levels of facility, management, and operational activities; and (c) ES&H-related deficiencies are identified, analyzed, and managed to minimize their occurrence or recurrence.

2) The Laboratory's self-assessment program has three legs. Management of Environment, Safety, and Health (MESH) reviews of each division are conducted by the institutional Safety Advisory Committee (SAC) on a nominal three-year cycle. ES&H Technical Assurance Assessments are conducted by EH&S Division SMEs to evaluate the performance of individual ES&H programs (e.g. Chemical Hygiene) across divisions. Division self-assessments are conducted by division staff to evaluate implementation of all ES&H programs needed to control hazards within a given division.

3) Each division is to develop and operate an ES&H self-assessment program consistent with the requirements specified in the PUB-3000 and the *Division Self-Assessment Manual* (PUB-3105). As an integral part of the ES&H self-assessment process, each division is to perform an annual evaluation of its implementation of the LBNL ISMS. The evaluation is to include a review of the division-specific ISM *Implementation Plan* to ensure it remains workable and current, and in conformance with this *Management Plan*. Appropriate workers and other key staff should be involved in the self-assessment.

4) The Office of Contract Assurance conducts independent oversight of the three legs of the Laboratory's self-assessment activities as described in *ES&H Self-Assessment Program* (PUB-5344).

6.7.1.3 Processes Are in Place to Measure and Reinforce ES&H Requirements and Expectations

1) Contract 31 establishes strategic performance objectives and measures as described in Section 9.2. Each performance objective and measure is assigned to a specific division that is responsible for providing the required information and tracking the status of performance. The Office of Contract Assurance (OCA) administers this process.

2) The ES&H performance measures process is managed at an institutional level. The SAC has a key advisory role in facilitating the ES&H performance measures process and integrating it into each division's ES&H performance metrics.

3) ES&H performance measure information is accessible to all employees.

4) Each division is responsible for having appropriate metrics to evaluate its ES&H performance.

6.7.1.4 Processes Are Defined for Analyzing Problems, Identifying Root Causes, and Ensuring Corrective Actions Are Taken

1) Each division is responsible for analyzing, tracking, trending, and correcting ES&H-related problems and deficiencies associated with its operations and facilities by using the Corrective Action Tracking System (CATS).

2) Each division is to record and track ES&H-related deficiencies in CATS consistent with the provisions and thresholds specified in PUB-3000. Each division is responsible for correcting deficiencies from requirements, as described in PUB-3000.

3) Each division is responsible for reporting, analyzing, tracking, and correcting ES&H-related occurrences consistent with the Laboratory's implementing procedure for occurrence reporting.

4) Serious ES&H-related incidents are to be formally reviewed, addressed, and reported as consistent with the provisions of PUB-3000. For incidents involving radiological facilities and activities, the Radiation Protection Group and OCA are to be involved, as appropriate.

5) Each division is to use medical surveillance examinations as appropriate to assess impacts of work on employee health.

6) Root-cause analyses are to be performed for occurrences, formal incident analyses, and other ES&H-related issues the division deems appropriate.

7) Senior management will include the use of CATS to identify, track, and resolve institutional cross-cutting issues that require senior management attention.

6.7.1.5 An Annual Assessment of LBNL's ISMS Is Conducted

The OCA prepares an annual report on the implementation of this *Management Plan*. This report summarizes results and details significant findings identified through the division's ES&H self-assessment activities.

1) The OCA is to periodically assess continued implementation of ISMS, both institutionally and at the division level. This is accomplished, in part, by review and roll-up of the division annual evaluations of ISMS implementation specified in Section 6.7.1.2.

2) Assessments of division implementation of ISMS will include division-specific documentation and actions as required by this document (e.g., Section 6.7.1.4) and PUB-3000.

3) The OCA will transmit the results of these assessments to the affected division directors and the Deputy Chief Operating Officer (COO) and COO for their information and any action that may be required.

6.7.1.6 Lessons Learned Are Effectively Transmitted

1) The Laboratory's Lessons Learned Coordinator gathers information regarding potential Lessons Learned from internal and external sources based on experiences considered relevant to Laboratory operations. Potential Lessons Learned are reviewed by several organizations within the Laboratory associated with ES&H activities, including members of the SAC, before being distributed.

2) Lessons Learned are to be shared to enhance operational ES&H and facilitate cost effectiveness. Individuals are to be encouraged to submit Lessons Learned.

3) Lessons Learned are to be prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product.

4) The Lessons Learned Coordinator transmits Lessons Learned to individuals identified by each division's safety coordinator. In addition, each division safety coordinator is responsible for ensuring transmission of Lessons Learned to other appropriate personnel.

5) Lessons Learned will be posted on the internal LBNL Web site.

6) The authorizing organization is responsible for ensuring that applicable Lessons Learned maintained on LBNL's internal Web site are considered during the process of authorizing work.

7) A review of Lessons Learned maintained on the internal Web site is to be incorporated into each division's self-assessment program to ensure continued use of relevant Lessons Learned. They are pushed out to workers based on identified hazards and controls in their JHAs.

8) As described in LBNL procedures, Lessons Learned are shared with the greater DOE community through DOE's Web site for Lessons Learned.

6.7.1.7 Improvements Are to Be Incorporated into the ISMS Implementing Documents

Based on the information derived from the various performance monitoring and feedback processes, appropriate improvements are to be incorporated into this *Management Plan*, PUB-3000, and division-specific documents, and the EMS Plan as appropriate. The process for revision of this Plan, and PUB-3000, is described in Section 8.4.

6.8 Conclusion

Unique issues and special cases not articulated in the set of core requirements in this section are to be addressed by the identified management chain and taken to the responsible division director for resolution and then, as necessary, to the Deputy COO and COO.

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7.0 WORK PLANNING AND AUTHORIZATION PROCESS

7.1 Introduction

The objective of the work planning and authorization process is to promote safe, environmentally responsible operations by ensuring that the hazards and environmental impacts associated with facility operations and work activities are clearly understood and appropriately managed.

Consistent with the graded approach process, the greater the hazards or significance of the environmental impacts associated with a facility or work activity, the more rigorous the preparation and authorization process required. In some cases, the authorization process will include environmental regulatory agencies. The Laboratory uses facility-based authorizations and has two Safe Work Authorization levels for work activities based on specific hazards, environmental impacts, and thresholds. The two Safe Work Authorization Levels are: Work Commonly Performed by the Public; and Line Management Authorized Work. Line Management Authorized Work has a further subset of Formal Authorized Work, which is usually of higher potential hazard and requires explicit controls [e.g., an Activity Hazard Document (AHD) or Radiological Work Authorization (RWA)].

Work Commonly Performed by the Public includes activities with hazards commonly accepted, which require little or no guidance or training to perform safely. When aligned with the concepts applied by the Procurement organization for subcontractors, the tasks associated with this work are determined to be noncomplex and nonhazardous when performed in a work location having only negligible hazards present (Section 6.2.2.3). It is recognized that skilled members of the public may conduct activities beyond the capabilities of the general populace, such as changing a faulty electrical outlet, or using a toxic and corrosive paint stripper. These types of activities are to be considered as requiring substantial guidance or training to perform, and as such, are not to be considered Work Commonly Performed by the Public.

For all other work tasks, including routine laboratory or shop work and work on equipment containing stored energy, Line Management Authorization must be granted. Authorization is a review and management approval process designed to ensure that procedures, controls, and resources are in place before the work begins. Review of the Job Hazard Analysis (JHA) is a primary example of this authorization.

Facility-based authorizations are independent of Safe Work Authorizations and provide a safety "operating envelope" based on all activities taking place within that facility. They are generally based upon operating permits from government agencies that must be obtained prior to operation of the facility. They define and document the content and particulars of activities allowed to take place within that facility. The Line Management and Formal Work Authorizations are based on the control of work-activity hazards and management of environmental impacts, and are used to define the hazards and environmental impacts, establish the controls, and

authorize a work activity. Line Management and Formal Work Authorizations must address all facility-based authorization constraints and conditions in their authorization process.

The basic functional relationship and the integration between these authorizations is that they ensure that a planned activity is done within the safety envelope authorized for a facility and that clear lines of responsibility are maintained. When used in combination, the structures provide a comprehensive and integrated approach to a formalized ES&H process, and enable consistent application across the Laboratory.

7.2 Facility-Based Authorization Structure

Facility-based authorizations provide safety "operating envelopes" based on all activities taking place within that facility. There are several formats of facility-based authorizations, and they may be initiated at any point, from design and construction through initial startup, operation, renovation, and final demolition, in a facility's life cycle. The Facilities Division prepares National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) documentation, and the EH&S Division prepares other facility-based authorizations (permits), but the operating divisions within the affected facility are responsible for conducting work within the defined safety "operating envelope" specified by the authorization, e.g., within the conditions of the permit. The Facilities Division and the EH&S Division function as the line organizations responsible for environmental management, including emissions and waste management, and for providing treatment and management services to the operating divisions. The types of facility-based authorizations include: air emission permits, wastewater discharge permits, Accelerator Safety Envelopes (ASEs), radiological hazards analysis documents, solid/hazardous waste generation/treatment permits, etc. Facility-based authorizations are addressed in detail in PUB-3000 Section 6.4, Appendix C of Chapter 6, and Chapter 21.2.

As used here, a "facility" means any equipment, structure, system, process, or activity that fulfills a specific purpose. At LBNL, a "facility" for purposes of a facility-based authorization is generally a building, but in some cases the "facility" may be an area within a building but not the whole building. Facility-based authorizations differ from Line Management Authorizations and Formal Authorizations in the following ways:

- Line Management and Formal Authorizations are based on individual activities, whereas a facility-based authorization is a function of some additional aggregate hazard or interaction among multiple operations or is a function of some piece of facility equipment (e.g., a paint spray booth or waste treatment facility).
- The operating division is generally not involved in obtaining or renewing facility-based authorizations; the activity is coordinated by LBNL (Facilities Division for NEPA/CEQA

issues; EH&S Division for all others). Accelerator operating permits, such as the ASE and supporting safety analysis documents, however, are usually the responsibility of the operating division.

The need for one or more facility-based authorizations (permits) may be triggered by new programs or facilities, or it may be triggered by changes in existing programs or facilities. Once a facility-based authorization is in place, it must be reviewed periodically to ensure that the actual operations comply with the operating envelope established for that facility. In addition, existing programs and facilities must be reviewed periodically to determine if changes in operations may trigger a new facility-based authorization. Facility-based authorizations are an independent constraint that overlay the Work Activity Authorization structure.

7.3 Work Activity Authorization Structure

All work activities must include attention to ES&H and use of the Integrated Safety Management System in order to address and improve the overall ES&H performance at LBNL. This can be accomplished by using the Work Activity Authorization structure and the different authorization levels described in this section. The structure and levels are connected to the safety hazards through the degree of understanding of the hazards and controls and the documentation that exists or is required for Work Activity Authorization. Consideration of environmental aspects and their impacts is required at all levels. This approach provides a single process for addressing the variety of hazards and environmental impacts at LBNL. In each level, there is a range of hazards and/or environmental impacts that are addressed by the type of controls and documentation cited. When a work activity is beyond those commonly performed by the public, preparation of a JHA and Job Hazard Questionnaire (JHQ) is required as described in Section 6.4.1.2.

The JHA process is designed to ensure front-end identification and understanding of an activity's hazards and environmental impacts, and to facilitate the development and implementation of tailored controls and reduction of environmental impacts. A single JHA may be used to cover projects or multiple activities of a similar nature. The JHA ensures a conscious formal process for work where there is no self-authorization allowed. Project participants and, as appropriate, ES&H professionals and subject matter experts are involved in the preparation and authorization process to help ensure attainment of the ISM objectives.

For certain situations, formal work permits are also necessary as described in PUB-3000. Examples of these would include AHDs, Laser Safety Documents, RWAs, Biological Use Authorizations (BUAs), Accelerator Safety Documents, and operating permits from regulatory agencies such as the California Department of Toxic Substances Control and the Bay Area Air Quality Management District. The hazard-analysis mechanism is identified for each level in the form of the people required to perform the function. PUB-3000 contains necessary specifics for the work reviews at each level as well as other information, definitions, and elaboration. Safe Work Authorizations are addressed in detail in PUB-3000 Section 6.2, and Appendices A and B

of Chapter 6. This chapter describes two levels of work authorizations: Line Management and Formal.

Line Management Authorization. Work activities beyond those commonly performed by the public and governed by existing ES&H documents are designated as Line Management Authorized work. Such activities require a JHQ/JHA to ensure proper planning, authorization, and documentation. Appropriate work controls are defined by references to PUB-3000 and other applicable existing ES&H documents. Environmental impacts are identified as applicable, and applicable environmental controls are applied. In cases involving more significant environmental impacts, the Environmental Management System (EMS) Core Team will get involved to fulfill responsibilities defined in the EMS Plan.

Formal Authorization. A Formal Authorization (e.g., AHD, RWA, BUA), is prepared when (a) it is required by provisions of PUB-3000 or (b) it is mandated by management. Authorizations mandated by any regulation would be included within PUB-3000 requirements. This is required whether the work is conducted on site or off site if LBNL has management responsibility. Specific requirements are provided in PUB-3000, Chapter 6.

Laboratory operations are designed to comply with (1) Contract 31 requirements; (2) LBNL internal policies, procedures, and standards; (3) federal, state, and local regulations; and (4) other ES&H Standards. However, there may be occasions when a specific work activity or facility requires a deviation from these established requirements. In those cases, organizations must request and obtain written authority to deviate from the requirements. This is called an exemption.

8.0 Integration of Program and ES&H Planning

8.1 Introduction

Integration of program and ES&H planning, from the Laboratory Director down to the individual worker, is accomplished following the Institution/Facility/Activity Process using this *Management Plan*, the Integrated Safety Management (ISM) Improvement Project Plan process, and the division-specific documents. This *Management Plan* and PUB-3000 incorporate the Integrated Safety Management System (ISMS) fundamentals that are essential to Laboratory operations.

Worker involvement is an essential part of ISM; therefore, an important integration direction is the formalized upward involvement and connection from workers in all of the functions and assignments. This integration needs to be operative upward through the institutional, facility, and activity processes, as well as from the top down. The Laboratory and the divisions must encourage, use, and recognize the suggestions, ideas, and efforts from the workers. Division safety committees are a formalized example of this process. Similarly, because of the LBNL mixed-matrix organizational structure, integrations across divisions and their program, home organization, facility, and services operational functions must also be addressed. These are addressed from the institutional perspective in this *Management Plan*. The necessary specifics for all directions of integration are contained in the division-specific documents or succeeding documents.

Documents that describe the integration of ISMS principles, the management chains important for proper integration, and means of communicating and training for these principles are also addressed in this section.

8.2 Division-Specific Documents

This *Management Plan* includes requirements that must be fulfilled at the division level. For example, each division must document the roles and responsibilities for positions within its organizational structure from the Division Director to the worker. The organizational structure of each division is tailored to meet its unique programmatic mission with different types of facilities, technical work, hazards, and environmental impacts. Additionally, each division has specific requirements for feedback and improvement that must be documented. To establish the flow-down of ISMS requirements from institutional requirements to the working level, each division develops an ISMS *Implementation Plan*. These plans tailor implementation of institutional requirements given in PUB-3000 and this institutional *Management Plan*.

Each division has the freedom to determine the best way to organize its division-specific ISM documentation. It may modify its existing ISM *Implementation Plan* or other existing safety documentation that succeeded the *Implementation Plan*, or create new documents. It is each division's responsibility to ensure that all required documents are prepared and shared with division staff, as appropriate. Each division director is responsible for approving the ISM

documentation and for the maintenance and configuration control of the division's ISMS implementation documents. Elements that must be addressed in each division ISM *Implementation Plan* are found in Appendix A. Elements required in division ISM *Implementation Plans* include: the purpose of the plan; ES&H roles, responsibilities, and accountability at all levels of the division, as well as for subcontracted workers, matrixed employees and students; as applicable, work on the UC campus, and other off-site locations; work authorizations; performance monitoring and feedback, the division self-assessment plan, injury and illness reporting tracking and analysis; investigations; communications of Lessons Learned; qualifications and training; and reporting employee concerns.

8.3 PUB-3000

The LBNL *Health and Safety Manual* (PUB-3000) defines Laboratory safety policies and provides for their implementation as specified by Chapter 7 of the LBNL *Regulations and Procedures Manual* (RPM, PUB-201). PUB-3000 development is also required for implementation of the DOE ISM program described in this *Management Plan*.

The requirements in PUB-3000 are based on the ES&H Standards Set contained in Contract 31. The ES&H Standards Set is identified for the specific work and associated hazards, environmental impacts, and best-management practices that have been determined to be LBNL requirements. PUB-3000 also describes the implementation of the ES&H management commitments made in this *Management Plan*.

The EH&S Division Director is responsible for developing, maintaining, publishing, and supporting the implementation of PUB-3000 and its supporting documents. A PUB-3000 Manager is designated to coordinate administration of the document and its updates. The PUB-3000 is organized by chapters that address specific technical or administrative ES&H subject areas, and each chapter has a responsible author who usually is a subject matter expert (SME) for the material covered by the chapter. Some chapters address multiple subjects, in which case the responsible author serves as an editor for multiple SMEs who contribute to the chapter's technical contents. The chapter responsible authors and SMEs are responsible for keeping the content of their chapters current. The chapter responsible authors are responsible for creating or using mechanisms that involve appropriate workers in the development and maintenance of compliant and effective safety programs (chapters). An example of mechanisms that support worker involvement would be using members of safety committees, such as the Electrical Safety Committee or the Institutional Biosafety Committee. Other mechanisms could include soliciting appropriate worker participation during safety meetings, etc.

The LBNL Safety Advisory Committee (SAC) makes recommendations to the Environment, Health, & Safety (EH&S) Division Director on the development and implementation of Environment, Safety, and Health (ES&H) policy, guidelines, codes, and regulatory interpretation. It conducts reviews of special safety problems, and provides recommendations for possible solutions to the Laboratory Director, Associate Laboratory Director for Operations (ALDO)/Chief Operating Officer (COO), and/or the EH&S Division Director as requested. The SAC also

provides advice and counsel to the ALDO/COO by reviewing appeals from Laboratory divisions when any division and the EH&S Division do not agree on the interpretation or application of criteria, rules, or procedures. Such advice and counsel may include options for a resolution.

The following controlling principles for PUB-3000 outline the basic requirements for the use, maintenance, and availability of PUB-3000.

- LBNL conducts work in accordance with PUB-3000.
- The EH&S Division Director develops and maintains PUB-3000 through SMEs and Laboratory Director-appointed committees, such as the SAC.
- The use of PUB-3000 is supplemented by SMEs and the EH&S Division liaisons who assist in the interpretation and implementation of the applicable requirements. The EH&S Division Director is responsible for maintaining both the SMEs and the EH&S Division liaisons for all of the broadly applicable topics.
- LBNL will update PUB-3000 on an ongoing basis through the SMEs and the Laboratory Director-appointed committees to ensure incorporation of requirements in the ES&H Standards Set in Contract 31.
- LBNL addresses the technical accuracy, efficacy, and completeness of PUB-3000 on a continuing basis. The review schedule for the PUB-3000 is developed and maintained by the PUB-3000 Manager with inputs from the SMEs and Laboratory Director-appointed committees.
- The electronic copy of PUB-3000, available through the LBNL Web site, is considered the official and current copy. All users are required to ensure they are working from this copy. Editable Microsoft Word files of PUB-3000 chapters are available for responsible authors and SMEs to download from the PUB-3000 eRoom.
- LBNL collects ES&H Lessons Learned and makes this information available to the Laboratory community. The Office of Contract Assurance coordinates this effort and addresses Lessons Learned that can be used to improve PUB-3000.
- Any exceptions to the requirements in the ES&H Standards Set will be addressed in a formal process commensurate with the hazards or environmental impacts involved, with any resulting fundamental changes addressed accordingly.
- The PUB-3000 Manager maintains PUB-3000 under a configuration management process to ensure that control is maintained during the development, revision, and communication of requirements from the ES&H Standards Set to the end users.

With these basic requirements, the EH&S Division Director, SMEs, and Laboratory Director-appointed committees will continue to conduct the necessary multifaceted and detailed process to incorporate ISM and the ES&H Standards Set into PUB-3000. The

incorporation process used for the ES&H Standards Set is described in Section 12, *Flow-Down of Requirements*.

8.4 ISMS *Management Plan*

This ISMS *Management Plan* (PUB-3140) is developed and vetted using the same process and procedure as is used for management of PUB-3000, except that it receives approval from the Department of Energy Office of Science (DOE SC) Berkeley Site Office (BSO) Site Manager. The EH&S Division Director assigns a publication manager who develops and maintains PUB-3140 through SMEs and Laboratory Director-appointed committees, such as the SAC. It is reviewed annually and approved by the Laboratory Director, the EH&S Division Director, and the BSO Manager. The process is found in PUB-3000 Chapter 1, Section 1.11 Appendix.

8.5 Management Chain

The important management chain for each work activity, from the worker and the first-level supervisor up through the responsible division director, is defined in Section 6.2.2.2. This includes a description and a basic framework of the operational functions, which provide an extension and clarification of the overall structure for the LBNL mixed-matrix organization. With these, a vertically integrated management chain exists for all LBNL operations so that the ES&H responsibility accompanies the funding chain.

8.6 Integration across the Laboratory

Another important element of ES&H integration is the horizontal integration across the divisions and the organizations within them. Horizontal integration is especially critical in achieving consistency in the implementation and use of ISM in all LBNL activities. It is also useful in the relationships with the other DOE organizations and particularly where they are working together.

Horizontal integration operates within many mechanisms at LBNL. The process starts with the Laboratory Director, Laboratory Deputy Director, the Chief Operating Officer, and the associate Laboratory directors (ALDs), and is achieved at their meetings and in their interactions together and individually. Next is the senior leadership, which includes the Laboratory Director, the Laboratory Deputy Director, the Chief Operating Officer, ALDs, division directors, and other top-level managers with broad institutional responsibilities.

The Laboratory Director-appointed committees, especially the SAC, assist with the critical function of horizontal integration. The established processes for these committees are particularly valuable in addressing the institution-wide issues, actions, and needs.

This *Management Plan*, the *ISM Improvement Project Plan*, PUB-3000*,* and other ES&H documents are additional major factors in horizontal integration. The availability of these on the LBNL Web site as well as the growing number of computerized aids for filling out forms, making evaluations, and reporting greatly increase the horizontal integration and the attendant values. Other entities across the Laboratory that contribute to horizontal integration include:

- Division safety coordinators and EH&S Division liaisons and their meetings and interactions.
- Procurement and Property Management connections with the division buyers.
- Structures within divisions, like Engineering and Computational Research, that provide matrix support to many parts of the Laboratory.

The regular meetings of the senior managers are commonly used for ES&H topics and are important in the horizontal integration.

Horizontal integration is greatly assisted by the communications and training addressed in the next section. The Laboratory-wide communications program and the institutional training courses help ensure that the ISM messages are consistent and clear.

8.7 Communications and Training

ISM communications have the long-term goal of helping to continually improve the Laboratory's ES&H culture. The strategy behind long-term communications and training is to position the concept of "workplace ES&H" alongside those of "scientific excellence" and "quality work" in everyday Laboratory life. This is being done by placing the subject of ES&H and key ES&H messages in front of employees frequently, using a variety of media, making sure employees have appropriate training, and by involving employees in identifying and solving ES&H problems.

ES&H communications, including training, are a continuing effort at LBNL, although the tone and emphasis on specific topics will change depending on current issues, employee input, and program actions. Integral to the program will be management leadership, personalized messages, continuity of effort, consistency of discussion, and capitalization of employee values, such as people's pride in the organization, their loyalty, and dedication to excellent work.

The steady flow of communications is designed to avoid overwhelming employees with messages concerning ES&H. The sustained effort will create the expectation that ES&H is part of everyday work discussions. These discussions will be enlivened by new topics presented periodically and by revisiting others as needed.

Many different communication tools and approaches are being used to engage employees at all levels. Planning includes campaigns to promote awareness of specific concerns such as eye protection or pollution prevention, expanded development and communication of Lessons Learned, promotion of the online PUB-3000, communications guidance for supervisors, computer-based information sources, and special events. Feedback mechanisms will be used to identify problems and successes, and then to share information back with the Laboratory community as ISM continues to mature.

Repetition of message. The objective here is to ingrain the subject of ES&H into the mindsets of all Laboratory employees, including subcontractors as they carry out the mission of the

Laboratory. A key element is maintaining employee awareness of ES&H issues using a variety of media. Communication begins with expectations being stated and discussed at senior management meetings and other management communication opportunities, and encouraging the practice to cascade through all organizations. *Today at Berkeley Lab* (TABL) and the ES&H Web site have an important role in the ES&H awareness effort. They regularly cover topics such as ISM successes, Lessons Learned, updates on the LBNL ES&H record, ES&H awards, and programs to hold employees accountable for following ES&H requirements. Other activities include:

- Periodic focus groups to allow management to hear directly from employees about ISM issues, and to demonstrate sustained management interest in the maturing and continual improvement of the ISM processes;
- Programs of monthly topical communications regarding both work-related and off-hours ES&H concerns. Communications planned on work-related topics include slips, trips, and falls; safe handling of poisonous materials; electrical safety; building safety; ergonomics; and protection of the environment.
- Development of resources to improve ES&H communications between first-line supervisors and employees. This includes specialized training, and Web-based and printed information.

Promotion of off-the-job ES&H. Excellent ES&H programs around the country also promote off-hours ES&H. The Laboratory will emphasize off-the-job ES&H during many of its monthly promotions. This includes issues such as poison prevention, bicycle safety, preventing sports injuries, environmental awareness, safe driving, fire safety, and special precautions to be taken during the winter and holiday season. Environmental awareness includes conservation of natural resources such as energy and water; prevention of pollution; protection of air, soil, water, and wildlife; and generation and minimization of solid and hazardous wastes.

A variety of media is used to promote off-the-job ES&H. These include posters, instructional flyers, videos, signs and banners, and activities such as demonstrations, speakers, and periodic safety fairs.

Participation of senior management. The vigorous participation of senior management is critical to the success of ES&H communications programs. Experiences at other sites, plus comments made by Laboratory employees, underscore this need. Examples of management activities conducted are walk-around programs, writing Director's Office columns for *TABL* and having division directors sponsor division-led ES&H promotions. Another important element is educating managers to the proper use of LBNL's case-management program. Management's vocal endorsement of ES&H efforts plus ongoing visibility regarding ES&H issues are important ingredients of this "best practice."

Ongoing training. Relevant training for employees at large has been incorporated into the existing training structure. This will ensure that new employees receive ISM training, and that

those moving from one division to another will receive specific training as appropriate. In addition, proper use of the Job Hazard Questionnaire and Job Hazard Analysis ensures that employees receive training needed for specific work assignments.

Reviewing the training needs of specific segments of the employee population is another important ongoing activity.

New curricula are being used as they are developed and approved.

Employee involvement. This aspect of the program involves encouraging employees to participate in identifying ES&H problems and developing solutions, including revising policy or procedures, rather than management attempting this entirely on its own. Examples of activities being used to encourage involvement include employee participation in the development of Laboratory policies and procedures, employee participation in key Laboratory safety committees such as the Safety Advisory Committee, and employee participation in continuous improvement activities such as incident investigations and division self-assessments.

8.8 Division ES&H (Safety) Committees

Each division will maintain an ES&H (safety) committee, consisting of a chair representing the division director/department head, one representative from each research group, and the EH&S Division liaison. The ES&H committee's duties are to:

- Review, maintain, and implement the ISM plan;
- Analyze Supervisor Accident Analysis Reporting (SAAR) injury and illness data;
- Promote ES&H awareness and training in environment, safety, and health topics;
- Review the need for specialized training;
- Provide for and/or conduct routine inspections and self-assessments;
- Participate in planning for the triennial Management of Environment, Safety, and Health (MESH) review;
- Develop metrics and analyze pertinent safety performance data;
- Advise division management on ES&H issues.

The ES&H committee will prepare an annual self-assessment report for the division director that includes an evaluation of how well this division ES&H plan is implemented. The ES&H committee also will ensure that the division works to improve the effectiveness of the division ES&H program through the dissemination of Lessons Learned and other appropriate feedback mechanisms.

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9.0 PROGRAM AND BUDGET EXECUTION GUIDANCE

9.1 Internal Process

Laboratory management is responsible for planning work and for ensuring that the Integrated Safeguards and Security Management System requirements for working safely while minimizing environmental impacts are incorporated into all activities, and are addressed in the prioritization and allocation of resources. ES&H is a primary consideration in planning and executing all work activities.

There are four primary ways ES&H and related functions are funded at LBNL:

1) Indirect Budget Call [General and Administrative (G&A) for institutional activities]
2) Unified Project Call Process (line item, general plant projects, and capital equipment projects)
3) Service centers (institutionally approved and recharged to users)
4) Direct programmatic funds

Indirect Budget Call. Budget requests for institutional EH&S Division functions are funded through the Indirect Budget Call. These requests cover institutional EH&S Division activities such as waste management, radiation exposure, industrial hygiene, dosimetry, ES&H standards and policies, monitoring, and site-wide environmental permitting. Budget submissions through the Indirect Budget Call are categorized into three types: Target, Over Target, and Investment. In addition, budgets are categorized as either Base or Non-Base budgets. Base budgets are defined as ongoing activities that have no specific end. Non-Base budgets include those activities with an end date and are not ongoing in nature. All budget items are characterized as Base or Non-Base.

Target budgets capture the most important, ongoing operations costs. All costs within this category are assumed to be Base. Over-Target budgets are requests in excess of the Target Budget. These are designed for either new requirements or activities deemed of such an important nature as to be included for incremental consideration, or that their exclusion would have a negative impact. With the possible exception of new requirements, Over-Target requests are prioritized after Target budget activities. Investment budget requests are incremental requests, which are justified by the future financial benefit received from the expenditure. The benefit received can be achieved in future years and must be quantifiable, demonstrable, and not solely for cost avoidance. The institutional justification for these types of requests is future financial savings in excess of costs incurred. The savings could be achieved either within the requesting division's budget, within other institutional budgets, or within the costs charged directly to scientific programs. Lastly, fenced budget items are defined as items where there is little or no discretion on cost levels, such as Fire Department costs.

Institutional Budget Activities (IBAs) are defined as a grouping of costs usually around departments that are consistent with the organization's organization chart. IBAs represent a logical breakout and accumulation point within a department that represents how these activities

are managed and how the activities can be communicated to others. The department heads are responsible for developing and prioritizing budget requests, which are then reviewed by the EH&S Division Director prior to submittal. All proposed budgets are presented to and reviewed by the Chief Operating Officer.

Unified Project Call. Berkeley Lab's Unified Project Call Process provides programmatic and infrastructure organizations the opportunity to examine their operational needs and to submit prioritized candidate Line Item Project, General Plant Project, Non-Capital Alteration, and General Purpose Equipment proposals in the budget process. It serves as a vehicle for implementation of the Laboratory's mission as expressed by Laboratory management and documented in Berkeley Lab's Ten-Year Site Plan and Institutional Plan, and facilitates Laboratory-wide coordination of divisional project proposals, Corrective Action Tracking System (CATS) project proposals, and Laboratory infrastructure improvement and expansion project proposals. Lastly, it identifies sources of funding to adapt facilities to new or improved production techniques; effect economies of operations; and reduce or eliminate safety, health, fire, environment, and security problems.

Service Centers. These centers are established where direct funding is not practical and activities can be charged to users based on usage or some other measure. Institutional service-center examples include site-maintenance costs distributed through the Laboratory facility charge, and procurement costs distributed through the material procurement burdens. The institutional service center budgets are reviewed in a manner similar to the Indirect Budget Call. Division directors are responsible for the general and financial management of service centers in their areas.

Direct Programmatic Funds. In the direct program area, management, from the Laboratory Director down, is responsible for establishing the priorities of the work. Division directors delegate ES&H authority to managers in their organization; however, division directors remain accountable to the Laboratory Director for ensuring that ES&H activities are performed according to LBNL requirements. The EH&S Division provides the necessary ES&H expertise, guidance, and services to assist division directors and their management chains in meeting ES&H requirements.

The remaining non-G&A-funded activity within the EH&S Division is the Safeguards and Security Program. The LBNL Safeguards and Security Program is a direct-funded program that employs a risk-based approach to providing cost-effective security for the Laboratory. The purpose of the program is to provide an appropriate level of security to protect employees, equipment, and property at the sites both on and off the main LBNL facility site. Through strategic planning and cost-benefit analysis, the Laboratory determines strategies to provide security services that add value to the scientific programs.

9.2 Performance Objectives and Performance Measures

The University of California (UC) is under contract to the DOE to LBNL. Clause H.14 of Contract DE-AC02-05CH11231 requires that UC "utilize a comprehensive approach for overall

Laboratory management. The performance-based management approach will include the use of objective performance goals and indicators, agreed to in advance of each performance evaluation period, as standards against which the Contractor's overall performance of the scientific and technical mission obligations under this contract will be assessed."

The mechanism for evaluating the management-based approach is the Performance Evaluation and Measurement Plan (PEMP), which is organized by goals, objectives, measures, and targets. The performance-based approach focuses on LBNL's performance against these goals. The DOE Office of Science (DOE SC) mandates that each SC laboratory, including LBNL, establish the same eight goals in the PEMP for key business principles. Goal 5 is to "Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health and Environmental Protection."

DOE SC also requires that each SC laboratory use the same objectives to measure progress against the performance Goals. UC, DOE, and LBNL functional managers establish performance measures and targets to measure successful fulfillment of these objectives. Measures identify significant activities, requirements, and/or milestones important to the success of the corresponding objective and are the primary means for determining LBNL's success in meeting the objective during the performance evaluation period. Targets for each measure indicate the "expected" level of performance.

The UC Office of the President (UCOP) Vice President for Laboratory Management submits an annual PEMP Self-Assessment Report to DOE and the Berkeley Site Office (BSO). LBNL management works closely with UCOP to develop the report. The primary basis for this report is LBNL's performance against the PEMP, and also incorporates input from UCOP and LBNL management.

An annual Performance Evaluation Report prepared by the DOE BSO Site Manager provides an evaluation of the Laboratory's performance during the appraisal period. The UCOP/ LBNL PEMP Self-Assessment Report is the primary basis for the annual appraisal of performance, recognizing that DOE SC will take into account other pertinent information, including operational oversight, program reviews, and audits.

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10.0 Standards and Requirements

10.1 Contract 31 Requirements

Contract 31 stands as the fundamental basis for the operations of the Laboratory. The Contract's current official language and provisions provide the legal basis for all activities. Clause I.79-DEAR 970.5204-2, *Laws, Regulations, and DOE Directives* (December 2000) (*Deviation*), taken from 48CFR970.5204-78 and effective October 1997, contains the fundamental operative statement in (a):

> *"In performing work under this Contract, the Contractor shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), unless relief has been granted in writing by the appropriate regulatory agency. A List of Applicable Laws and Regulations (Appendix I/List A) may be appended to this contract for information purposes. Omission of any applicable law or regulation from Appendix I/List A does not affect the obligation of the contractor to comply with such law or regulation pursuant to this paragraph."*

The ES&H Standards Set in Contract 31 provides the ES&H requirements for LBNL as of September 2009. These, along with the ongoing actions on noncontract standards and practice, are being incorporated through an established LBNL process into PUB-3000 and other operating documentation (see Section 12.2). Contract 31 contains in Clauses I.79 and I.86 the language providing for ES&H Standards and Integrated Safety Management (ISM), respectively, and their incorporation upon completion, as described in other sections of this *Management Plan*.

10.2 ES&H Standards

In November 2008, the Berkeley Site Office (BSO) Contracting Officer determined that the existing process for necessary and sufficient standards under Clause1.86, commonly known as the Work Smart Standards, had not been a timely mechanism for updating requirements into Contract 31. In lieu of that process, the BSO Contracting Officer required use of the process outlined in Clause H.18 for all DOE directives, including those applicable to the environment, safety, and health (ES&H). Recognizing that there was value in maintaining the ES&H requirements separately from the rest of Appendix I directives, the list was renamed the *Environment, Safety and Health Standards for LBNL*. Since "necessary" and "sufficient" standards would no longer have their prior connotations, the two lists were collapsed into a single list of standards. DOE Directive DOE M 450.3-1, *The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards*, was removed from the contract.

The ES&H Standards Set is important as an input to the Integrated Safety Management System (ISMS) and as a key operational component for developing controls. It also fulfills Guiding Principle 5: Identification of Safety Standards and Requirements, in a conscious, organized, and broadly reviewed manner. The evaluation of work at the facility and activity levels, as described in Sections 6 and 7 of this *Management Plan*, uses the ES&H Standards Set. Establishing the

ES&H Standards Set while the ISMS *Management Plan* was in preparation allowed the appropriate connections to be made and aligned with current thinking and needs. In the relationship between ES&H Standards and ISMS, the ES&H Standards Set provides the general and specific requirements tailored to LBNL activities, and the ISMS establishes the structure and implementation mechanisms for using the ES&H Standards Set as the basis for performing work safely while minimizing environmental impacts.

With these contractual obligations and the DOE Policy and supporting documents, the Laboratory and DOE Office of Science (SC) Berkeley Site Office (BSO) initiated the process in May 1997 to select an ES&H Standards Set applicable to the work at LBNL. The process was formal, with structured elements and accompanying documentation. A convened group, which is the process steering committee with members from LBNL, the University of California (UC), and DOE BSO, was established to manage and support the successful completion of the process and selection of the ES&H Standards Set. ES&H professionals from LBNL, DOE BSO, UC, and other DOE sites working with Laboratory program, facilities, and operations personnel obtained a comprehensive understanding of the work and hazards, including environmental impacts, and established the appropriate set of standards that when implemented provide adequate protection to the workers, the public, and the environment. All personnel involved were selected individually by the convened group upon review of credentials against established participation criteria. All participants were trained to the DOE-approved training modules.

The ES&H Standards Change Management Process, using a team approach, focuses on the work and its associated hazards and environmental impacts to select those standards that provide the appropriate level of safety and environmental protection. For LBNL, the work and associated hazards and environmental impacts were identified for a carefully chosen set of representative facilities. Based on this information and extensive knowledge of ES&H Standards, the Standards Identification Team selected the appropriate standards that collectively apply to the institution. These standards were reviewed internally and confirmed to be appropriate and feasible by an outside independent team of ES&H experts. With the satisfactory completion of the confirmation step in March 1999, the ES&H Standards Set was forwarded to the approval authorities, the LBNL Director, and the DOE BSO Manager; was signed August 1999; and was incorporated into Contract 31.

10.3 Maintenance of ES&H Standards

As changes occur, there will be new knowledge, technologies, and issues, along with new laws, regulations, and standards. Consequently, the ES&H Standards Set in Contract 31 must be reviewed and updated periodically, using a formal process. A formal Change Management Process for the ES&H Standards is described in Appendix C. The Change Management Process provides an important opportunity to keep the ES&H Standards Set up to date and includes provisions for addressing new and special situations that might arise.

This process has resulted in revisions to the ES&H Standards Set, such as in 2007, when the set was revised to include 10CFR851, *DOE Worker Safety & Health Program*.

11.0 Evaluating and Resolving Noncompliances

11.1 Requirements

Under the provisions of Contract 31, the Laboratory and the University of California Office of the President conduct an annual institutional-level self-assessment to evaluate management performance in a number of administrative and operational areas, including ES&H. This self-assessment is made against a set of performance goals, objectives, measures, and targets (see Section 9.2). Department of Energy Berkeley Site Office (DOE BSO) reviews and verifies the self-assessment report and the Laboratory's performance.

Annual institutional-level self-assessment, Office of Contract Assurance evaluations, and other special reviews are accompanied by DOE BSO management through appraisals of the Laboratory, which include several ES&H areas.

In addition to the institutional assessments, LBNL has a well-developed, ongoing self-assessment program that is specified in the PUB-3000 and PUB-5344. These Laboratory organization self-assessments evaluate the effectiveness of adherence to ES&H requirements and implemented controls at both the facility and activity levels.

The formal self-assessments of the Laboratory provide the status at a particular time. Also important are the wide variety of ongoing multifaceted review processes conducted by LBNL personnel that provide timely information on and insight into the status and performance at each level within the Laboratory.

11.2 Issues Management Program

The Lawrence Berkeley National Laboratory (LBNL) Issues Management Program (IMP) encompasses the continuous monitoring of work programs, performance, and safety to promptly identify issues to determine their risk and significance, their causes, and to identify and effectively implement corrective actions to ensure successful resolution and prevent the same or similar problems from occurring.

This comprehensive institutional program is made up of four Program Manuals, two databases and two implementing procedures. These tools define and implement the process for issues identification, tracking, resolution, closure, validation, and effectiveness of corrective actions. Issues that are governed by this program include program and performance deficiencies or nonconformances that may be identified through employee discovery, internal or external oversight assessment findings, suggested process improvements, and associated actions that require formal corrective action. Issues may also be identified in and/or may result in Root Cause Analysis reports, Price-Anderson Amendments Act reports, Occurrence Reporting and

Processing System reports, Accident Investigation reports, assessment reports, and External Oversight reports.

Analysis of issues, individually and collectively, is performed in order to identify programmatic or system issues and to identify recurrence of issues, generic issues, trends, and vulnerabilities at a lower level before significant problems result.

Lessons Learned and Best Practices, based on LBNL's and other facilities' operating experiences, are developed to ensure ongoing improvement of safety and reliability, prevent the recurrence of significant adverse events/trends, and determine implementation strategies that will help LBNL successfully meet the missions and goals set forth by the Department of Energy.

11.3 Corrective Action Tracking System (CATS)

The Laboratory has implemented a Web-based system to track assessments, deficiencies, issues, and corrective actions. The system is known as CATS. It serves as the means for LBNL management to identify, track, and review resolution of institutional deficiencies and issues. Deficiencies are coded so that trending of findings can take place. Each division enters and maintains its deficiencies and issues on the CATS database. The system is administered by the Office of Contract Assurance.

12.0 Flow-Down of Requirements

12.1 Basics

The LBNL institutional ES&H requirements apply to the entire Laboratory workforce. These are contained in the ES&H Standards Set in Contract 31. Chapter 7 of the LBNL *Regulations and Procedures Manual* (RPM, PUB-201) specifies implementation of these requirements through the Integrated Safety Management System (ISMS) process and through PUB-3000. The ISMS provides the process to connect the ES&H Standards Set to the work, implement it, and to conduct work safely while providing responsible environmental stewardship. By executing work in accordance with the controls developed from the ES&H Standards Set through PUB-3000 requirements, the workforce, the public, and the environment are adequately protected.

The LBNL ISMS process incorporates the tailoring of requirements in addressing mission needs, plus the hazards and environmental impacts associated with them. As the range and scope of work activities change, the associated controls, including regulations and standards, are adjusted accordingly. This *Management Plan* and PUB-3000 provide the institutional approach for integrating ES&H requirements into the processes of planning and conducting work and are the basis for alignment and content of the lower-level ES&H documents. The ISMS becomes more detailed and specific in the lower-level documents that provide the organizational structures (divisions, groups, and departments) and operational processes.

Laboratory operations are addressed through ES&H management processes and controls contained in PUB-3000 and other documents. These processes include management direction for planning and conducting work activities, and facility management for work performed on the LBNL sites, as well as for work performed by LBNL personnel at other locations.

PUB-3000 and other institutional-level documents establish the processes to be used by Laboratory programs and organizations, facilities, and the Laboratory workforce. These documents include formal processes, including configuration management, used throughout the Laboratory for applying and establishing institutional-level requirements and practices locally at the facility and activity levels.

As hazards or environmental impacts increase, so do the formality, intensity, and redundancy of controls and assurance measures. Laboratory manuals and institutional documents define the explicit institutional consistency for formality of planning, documentation of process activities, record keeping, the level of independence of people involved in their review, and confirmation of adequacy needed for establishing facility- and activity-specific expectations. They allow the established requirements to be appropriately tailored to meet specific needs of facilities and activities while covering a wide range of work and the associated hazards and environmental impacts. These manuals and other institutional-level documents also establish Laboratory requirements for other areas of ES&H management that involve the development and tracking of corrective actions, such as occurrence reporting, accident analyses, and self-assessment and improvement processes. Similarly, they establish technical requirements and often prescribe

explicit administrative and engineered controls for specific hazards. The required controls are mandatory anywhere throughout the Laboratory where the work activity manifests similar hazards.

12.2 The PUB-3000 Process

The process for establishing LBNL's ES&H requirements involves three key steps:

1) Development of the ES&H Standards Set to accommodate changes in the range and scope of LBNL work and incorporation of the set into Contract 31 (see Section 10).
2) Identifying new and changing laws and regulations, Contract 31 requirements, and UC policies as applicable to current and new work at LBNL. This is accomplished by the ES&H Standards Change Management Process.
3) Incorporation of the appropriate requirements from the ES&H Standards Set into PUB-3000.

The overall process is described in the following subsections and is shown in Figure 12.1.

12.2.1 Identification of Requirements

LBNL's ES&H requirements are derived from numerous sources, but come primarily from federal, State of California, regional, and local statutes, regulations, and ordinances; DOE directives; national consensus standards; and University of California (UC) policies. The range and scope of work at LBNL is dynamic, as are the regulatory and contractual requirements. As both change, the ES&H Standards Set is adjusted. These are all included in the LBNL ES&H Standards Set and incorporated into Contract 31 as described in Section 10.

LBNL relies primarily on the professional staff in its institutionally managed EH&S Division staff, the Office of Contract Assurance, and the Office of the Laboratory Counsel to monitor for new and changing regulations and DOE directives that pertain to the work, its associated hazards, and environmental impacts at LBNL, and the standards in the ES&H Standards Set. LBNL interacts with regulatory agencies, UC, and DOE staff through meetings and site visits. The Laboratory also makes heavy use of modern communications systems as part of its information resources. When requested, ES&H experts and programmatic personnel review and comment on proposed revisions to existing DOE directives, new directives, and proposed rules.

12.2.2 Evaluation of Requirements

EH&S Division management assigns staff personnel to review, interpret, and analyze proposed and final regulations, rules, and DOE directives. These reviews assess whether the potential requirements specifically apply to the work performed at LBNL and, if so, decide (1) whether compliance actions will have to be implemented Laboratory-wide or limited to only one or a few organizations, and (2) when they become effective through the ES&H Standards Change Management Process. Detailed considerations are made of the scope and use of potential requirements, whether they have Institutional Scope and Broad Use, Specific Scope and Broad Use, or Specific Scope and Narrow Use (see Section 14.1 for definitions) to direct and use them

properly. The potential impacts on Laboratory operations are also evaluated (e.g., the need for additional training, record keeping, reporting, new instrumentation systems, and modifications of existing facilities and operations).

The next step involves a review of the analysis of new requirements and impacts by Laboratory Director-appointed committees, particularly when institutional implementation of requirements is indicated and significant costs are associated with compliance. The organizations represented on these committees provide feedback to the ES&H professionals on programmatic and cost impacts and the practicability of proposed implementation actions.

In some situations, the impact of a requirement or standard is limited to a small group of individuals or a specific department. These limited-impact requirements may be handled directly by the affected organization through its subject matter experts.

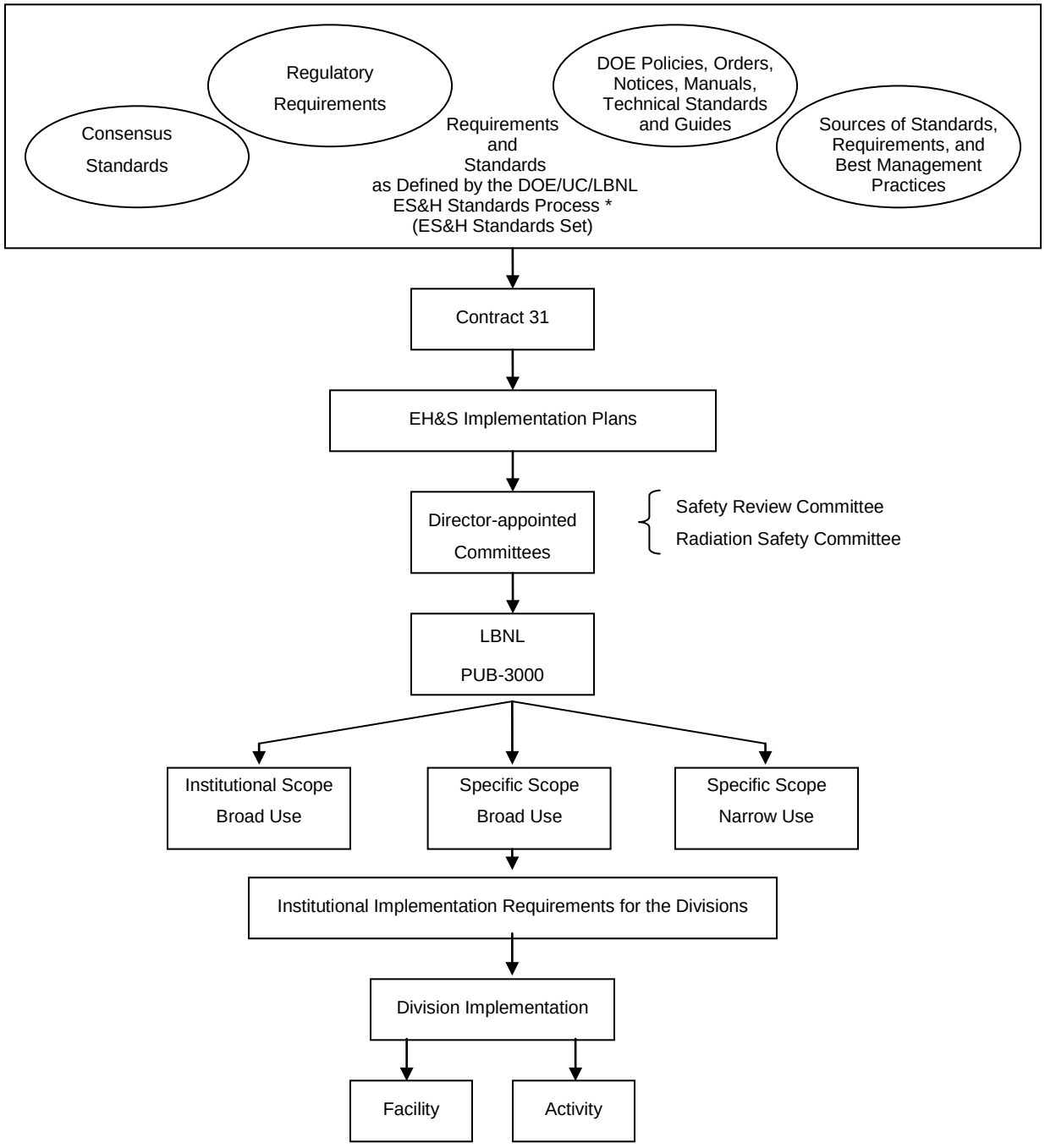
12.2.3 Incorporation of Requirements

A variety of activities may be used to communicate new requirements once they have been determined. These include establishing a time line for implementation, and determining how the requirement will be added to the documentation base. This may result in a new policy or guidance document or a modification to existing documentation, such as a modification to PUB-3000.

PUB-3000 is developed and revised to aid management in integrating requirements into Laboratory work activities. This manual either contains specific requirements or points to other documents containing the requirements applicable at LBNL. Generally, if the requirements are applicable to only a small subset of individuals at LBNL, or if the requirements are extensive and complex, PUB-3000 will merely point back to the original requirements. In those situations when PUB-3000 provides pointers, ES&H professionals will assist in the interpretation and implementation of the applicable requirements.

12.2.4 Requirements to Users

Individuals responsible for work activities are responsible for ensuring that the hazards and environmental impacts associated with the work are analyzed and controlled according to PUB-3000. Controls in PUB-3000 or those identified by the ES&H professionals are to be implemented by those performing the work activities, unless an exemption from those controls has been appropriately approved. The Laboratory has a formal process for obtaining exemptions and variances described in Section 12.6.



* DOE M 450.3-1, DOE Closure Process for Necessary and Sufficient Sets of Standards

Figure 12.1 Information Flow-Down Process for the PUB-3000 and Implementation

12.3 Subcontractor ES&H Management

In Integrated Safety Management (ISM), the necessary focus of the subcontractor requirements is on the safety of the workers and the impact their actions have on the environment. Basic to all of the requirements are those in Contract 31, Clause I.79. In the LBNL ISMS, the core requirements for subcontractors are in Section 6.2.3. Application of these requirements, appropriate core requirements in Section 6, provisions of Section 7, and PUB-3000 are necessary to meet the subcontractor ES&H management responsibilities.

The Procurement and Property Management Department (P&PM) is responsible for ensuring that ES&H requirements are included in the subcontractor operational process and procedures that control how subcontractors perform work for LBNL. The system to accomplish this must involve the organizations requesting the subcontract work and, as necessary, the appropriate EH&S Division subject matter experts (SMEs) and liaisons. All are critical elements of the system, and have their own particular responsibilities in a structured process defined in Section 6.2.3.4 of the ISMS. The system ensures that appropriate subcontract-ES&H requirements are included in contractual language that binds the subcontractor to maintain alignment with the established procurement practices. These ES&H requirements include the applicable ES&H clauses and standards.

The system includes the details of the Laboratory's oversight responsibilities for a subcontractor's ES&H management system in the subcontract language. It also ensures the flow-down of appropriate ES&H requirements, and ensures that subcontractors are evaluated and selected on the basis of historical ES&H performance and other relevant criteria. Additional information and elaboration are in PUB-3000 and the P&PM *Department Procedures*.

12.4 Procurement and Property Management

The procurement of goods and services is a key function to be addressed as part of ISM. This is accomplished in the LBNL ISMS through the use of a procurement ES&H management process that determines the hazards and environmental impacts of the goods and services to be procured, received, and delivered to the point of intended use. The process provides a determination of the hazards and environmental impacts for ordered goods and services that are hazardous, dangerous, or toxic. The planned use of these is addressed in the work-activity evaluation, documentation, and authorization process defined in Section 7.3 (i.e., a Job Hazard Analysis).

In the procurement ES&H management process, the requesting organization provides the procurement entity with the proper hazards and environmental-impacts determination so that the ES&H responsibilities can be fulfilled. This is consistent with the ES&H requirements in Contract 31, the applicable core requirements in Section 6, the provisions of Section 7, and PUB-3000. In the process, the organization requesting the goods and services evaluates and determines the hazards and environmental impacts of the goods and services being ordered. The appropriate EH&S Division SME and/or liaison assists in this process, as necessary. The

resulting hazards and environmental-impacts determination is provided to the procurement entity along with the purchase request. P&PM maintains the necessary procedures for the conduct of this process. Additional information and elaboration are in PUB-3000 and the *P&PM Procedures*.

12.5 Lessons Learned

Lessons Learned are shared to improve operational ES&H by benefiting from the experience of others. Lessons Learned are prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product. The core requirements for Lessons Learned are defined in Section 6.7.1.6.

LBNL has an established Lessons Learned program. It includes the basic elements presented in DOE Standard *Development of Lessons Learned Programs*, DOE-STD-7501. This standard is used as it is included in the ES&H Standards Set, and provides guidance in the daily conduct of the LBNL Lessons Learned program. Lessons Learned form an integral part of the Laboratory's ISMS and represent an important mechanism in accomplishing DOE Core Function No. 5—Provide Feedback and Continuous Improvement.

The Lessons Learned Administrator (LLA) in the Office of Contract Assurance conducts the Lessons Learned program. The LLA, in relation to the core requirements, is responsible for:

- Gathering and analyzing information while focusing on issues most relevant to LBNL operations;
- Coordinating a review of prospective Lessons Learned by the various ES&H organizations, including the Safety Advisory Committee (SAC) and division safety coordinators;
- Distributing Lessons Learned in a timely manner;
- Posting Lessons Learned on the LBNL internal Web site;
- Serving as a point of contact for follow-up and feedback to the Laboratory, as necessary, on actions taken in response to Lessons Learned;
- Transmitting Lessons Learned to DOE through DOE's Web site for Lessons Learned.

Divisions should encourage employees to bring to the attention of supervisors or division safety coordinators topics that could serve as possible Lessons Learned. Each division safety coordinator, in consideration of the core requirements, is responsible for:

- Ensuring distribution of Lessons Learned to appropriate LBNL personnel;
- Bringing to the attention of the SAC appropriate Lessons Learned in a timely manner;

- Identifying Lessons Learned that require follow-up action, and providing information to the Lessons Learned Administrator regarding what action has been taken;
- Identifying Lessons Learned from his or her division to be forwarded to the Lessons Learned Administrator.

12.6 Exemptions and Changes

The Laboratory has formal processes, described in PUB-3000, by which organizations and individuals can seek deviations, exemptions, variances, or waivers to institutional requirements contained or referenced in PUB-3000. Given valid justification, organizations and individuals can obtain a particular exception from established institutional requirements as long as equivalent or compensatory measures are in place to meet the requirements. The exception nomenclature, the necessary accommodations, and approval levels depend on the requirement specifics. This may require DOE or other governmental agency approval.

PUB-3000 and other ES&H institutional documents can be changed at the discretion of the Laboratory as long as they remain consistent with the requirements in Contract 31 and this *Management Plan*.

Changes to existing ES&H policies and procedures or the generation of new ES&H policies may be proposed by a division, the ES&H staff, a Laboratory Director-appointed committee such as the SAC, or other senior managers. New ES&H policies or major changes to existing ES&H policies and procedures are recommended by the relevant SMEs or appropriate Laboratory Director-appointed committee to the EH&S Division Director for approval.

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13.0 Definitions

13.1 Definitions

Assure	To verify that something was done.
Authorizing individual	The person designated by an authorizing organization who is responsible for a work activity's technical, financial, administrative, and ES&H objectives. Also, the individual authorized by a division director (or designee) to accept and manage, on the Laboratory's behalf, the risks associated with the work activity. This person authorizes the work to proceed only after all controls are implemented and confirmed.
Authorizing organization	The Laboratory organization (e.g., division or group) responsible for a work activity's performance. This includes ensuring adequate funding and determining work priorities.
Base skills	The skills, knowledge, and abilities (SKAs) necessary for a particular vocation and level.
Commonly performed by the public	An activity with hazards and environmental impacts commonly accepted, the control of which require little or no guidance or training in order to perform the work safely while minimizing environmental impacts.
Division	The set of organizational elements (e.g., departments, divisions, groups, programs, projects, offices) operating within the management responsibilities and authority of a division director
Ensure	To cause something to be done, either by doing it or by following up on assignments and delegations to verify that something was done. To guarantee a particular outcome. The Laboratory uses this term when referring to situations involving direct responsibility for activities, as in the case of the safety line manager.
Environmental aspect	An element of an organization's activities, products, or services that can interact with the environment.

Environmental Management System	A structured process to manage and control an organization's impact on the environment. It includes creation of an environmental policy that sets objectives and targets a program of implementation, effectiveness monitoring, problem correction, system review, and continual improvement. An environmental management system also identifies key resources and holders of responsibility for determining and implementing environmental policy, and communicating facets of the system to the entire organization.
ES&H professionals	The LBNL subject matter experts and members of the ES&H teams.
ES&H Standards Set	The set of standards that is necessary and sufficient to meet LBNL ES&H performance expectations and objectives. The ES&H Standards Set provides adequate protection for workers, the public, and the environment. All work performed at LBNL and the associated hazards must be covered by one or more of the standards in the ES&H Standards Set.
ES&H Standards subject matter expert	A designated LBNL employee with knowledge and expertise relevant to the work or one of the ES&H discipline areas who selects and works with the applicable ES&H Standards.
Facility	A building, group of buildings, or specific area of the Laboratory that is managed by a single responsible division director. May also be used to indicate a portion of a building, such as a laboratory or group of laboratories dedicated to a specific operation.
Graded approach	A method that provides for varying levels of rigor and formality when applying controls commensurate with the hazards and environmental impacts involved. This method ensures that the depth of detail required and the magnitude of resources expended for operations are commensurate with each facility's programmatic importance and potential environmental, safety, and health impact.
Hazard	A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility.

Implementation Plan	A documented plan describing how requirements and expectations will be accomplished. Following implementation at the division level, divisions may transition the *Implementation Plan* to other established division plans or documents (e.g., ES&H *Management Plans*, ISM *Management Plans*, and QA Plans) that satisfy the requirements specified in this *Management Plan*.
Institutional scope and broad use	Requirements that are general in scope and apply broadly to the Laboratory. Examples include general ES&H programs (e.g., industrial hygiene, industrial safety, health physics, and pollution prevention), training, and quality assurance. The requirements for hazards and environmental impacts frequently encountered at the Laboratory are generally specified in the PUB-3000.
Organization supervising work	An organization distinguished by having responsibility for supervising or watching over the performance of people involved in carrying out a work activity and ensuring that work requirements are met.
Home/Payroll Division Director	Division director who provides technical and specialty personnel to support program activities directly and by matrixing personnel to support the activities of other divisions. Responsible for the technical and specialty qualifications, basic job training, and administrative support. Also described as an administrative division director.
Program Division Director	Division director who provides program deliverables through control of and use of funding. Responsible for work authorization, technical deliverables, ES&H, business management, and staff work direction. Uses the funding for personnel, facilities, and services in own division and buys matrixed “payroll” personnel and other divisions’ facility capabilities, services functions, and products.

Safety	The word "Safety" has previously been used to represent the DOE's Policy 450.4 (*Safety Management System Policy*) and previously was used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment as defined in DOE P 450.4. Contract 31, Clause I.86, expanded the definition of ES&H by "including pollution prevention and waste minimization." This *Management Plan* was revised to place additional emphasis on environmental management. When Safety is footnoted in this document as Safety([1]), it is being cited per DOE P 450.4 and Clause I.86 of Contract 31. In all other cases, the use of the word "safety" represents safety in the traditional sense.
Safety envelope	The parameters defining the limits for the safe and environmentally responsible operation of a facility or operation. For example, the maximum amount of material, the maximum operating temperature, permit conditions related to a permitted activity (solvent degreaser), and the maximum pressure are boundary conditions that may specify portions of the ES&H envelope.
Safety line management	The unbroken linear safety management chain from the Laboratory Director to each worker. Above the lowest organizational unit in each division (e.g., first-line Human Resources (HR) supervisor), the chain is defined by the succession of direct reports that establish job assignments, appraise performance, and determine salaries. Below the first-line HR supervisor level, the chain can include workers at any level, and may include nonmanagement work leads who guide the day-to-day activities of one or more workers.
Safety line manager	A generic term for an individual directly responsible for an operation, activity, or group of activities. The safety line manager may be at any level within the organization and is formally identified by the activity's authorizing individual. In some organizations, this person is called the work supervisor. In most cases, the safety line manager will be directing the work of others as part of the operation or activity. Examples of safety line managers are work lead, supervisor, manager, group leader, project leader, project engineer, and Principal Investigator. The safety line manager is not necessarily a worker's Higher Education Employer-Employee Relations Act (HEERA) supervisor.

Self-assessment	An assessment performed by the responsible organization to determine how well it is performing its jobs and meeting its responsibilities.
Self-assessment plan	A formal, management-approved document that describes a division's self-assessment activities and how often they occur, provides a schedule for completing the assessments, and identifies the reports to be generated.
Services division director	Division director who provides "fee for services" functions, facilities, and products. Responsible for work authorization, technical deliverables, ES&H, business management, and staff work directions.
Significant environmental aspect	An environmental aspect that has or can have a significant environmental impact; any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.
Specific scope and broad use	Requirements that are relatively specific in scope and apply broadly to the Laboratory. Examples include emergency preparedness, fire protection, and engineering standards. For example, some engineering design standards may pass through directly to the engineers without manuals, guides, etc., to assist the engineers other than the stated recognition that the (design) standards are to be used.
Specific scope and narrow use	Requirements that are relatively specific in scope and apply to a limited set of staff, groups, or activities. Examples include firearms and personnel assurances.
Subject matter expert (SME)	An LBNL employee who is a recognized authority in a particular field. This might include a person from ES&H Division, Facilities Division, Engineering, Computations, etc.
Tailored controls	Engineered and administrative controls, as well as personal protective equipment, selected from the ES&H Standards and LBNL's PUB-3000 and designed to fit a particular work activity. Properly tailored controls will address hazards and environmental impacts, satisfy the applicable requirements, and provide adequate protection to the public, workers, and the environment.

Tailoring	Adapting something—such as a control, safety program, practice, or requirement within the ISMS—to suit the need or purposes of a particular operation or activity, taking into account the type of work and associated hazards and environmental impacts.
Work lead	A person authorized by line management to direct, train and/or oversee the work and activities of one or more workers. Work leads provide instruction on working safely and the precautions necessary to use equipment and facilities safely and effectively. Work leads need not be line managers, HEERA-designated supervisors, or LBNL employees. Work leads are often worker peers, postdoctoral students, or graduate students. All work leads are safety line managers.
Work review	A review of the integrated set of ES&H controls, resources, and schedules; usually conducted before beginning a work activity.

14.0 References

1. DOE Order 450.1A, *Environmental Protection Program.*

2. Department of Energy (DOE) Prime Contract DE-AC02-05CH11231 (Contract 31), June 1, 2005, with approved modifications.

3. DOE P 450.4, *Safety Management System Policy*, October 15, 1996.

4. DOE G 450.4-1, *Integrated Safety Management Guide for Use with DOE P 450.4, Safety Management System Policy, and DEAR Safety Management System Contract Clauses*, Nov. 26, 1997.

5. DOE G 450.4-1A, *Integrated Safety Management System Guide for Use with Safety Management System Policies* (DOE P 450.4, DOE P 450.5, and DOE P 450.6), May 27, 1999.

6. Partnership Agreement between UCB and LBNL Concerning Environment, Health and Safety Policy and Procedures. http://www.lbl.gov/ehs/ism/ucb_lbl_partnership_3_15_04.pdf

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APPENDIX A

Division ES&H Plan Checklist

Division ISM Implementation Plan Review

Division: Plan version/source:

Date:

Institutional ISM Plan Section:	Description of Division ISM Implementation Plan Requirement	Addressed? y/n	Comments *Describe where requirement is met, or why omitted.*
1.0	Purpose		
2.0	Description of Division/ Department/Organization, Mission, and Scope of Work		
3.0	ES&H Roles, Responsibilities and Accountability		
3.01	Division Leadership Responsibilites		
3.02	Supervisor/PI Responsibilities (e.g., group leaders and formal supervisors as appropriate		
3.03	Work Leads		
3.04	Staff/Worker Responsibilities		
3.05	Subcontracted Work and Staff		
3.06	Matrixed Employees		
3.07	Student Safety		
3.08	Division Safety Coordinator		
3.09	Safety Advisory Committee Member		
3.10	Building Manager Responsibilites		
3.11	Work at UC Berkeley Campus		
3.12	Offsite Work		
3.13	Telecommuting		
4.0	Division ES&H (Safety) Committee		
5.0	Scope of Work Authorized		
5.01	Work Locations, Facilities, and Work Location Hazards (e.g., HMS System)		
5.02	Work Requiring Specific Authorization (e.g, list group JHAs, point to system)		
6.0	Performance Monitoring and Feedback		
6.01	Division Self-Assessment Plan		
6.02	Division Walk-around Inspection Process & Schedule		
6.03	Injury & Illness Reporting, Tracking and Analysis		
6.04	CATS Tracking of Deficiencies		
6.05	Mishap Investigation (e.g., ORPS, SAARs)		
6.06	Near Hits (Precursors) Discussion and Lessons Learned		
7.0	Qualification and Training		
7.01	Supervisor Training		
7.02	Work Lead Training		
7.03	Employee/Worker Training		
7.04	Medical Surveillance		
8.0	Emergency Preparedness		
9.0	Reporting Employee Concerns		
10.0	Balanced Resources		

Division ISM *Implementation Plans* must address each of the elements in the above table that are applicable to their division. Division ISM plans are reviewed annually by the EH&S Division to identify required and recommended topic areas. This checklist was developed based on requirements in this Institutional ISM Plan, PUB-3000, and input from division safety coordinators. Use of the checklist is described in Section 8.2, *Division-Specific Documents*. An electronic version of this checklist can be accessed at:

http://www.lbl.gov/ehs/ism/assets/docs/ISM_Division_Plan_Checklist.doc

Prior to Revision 7 of the Institutional ISM Plan, a more prescriptive Division ES&H Plan (Sample Template) was provided for divisions to develop their implementation plans. During the FY 2008 and FY 2009 ISM review cycle, that template was replaced by the checklist provided above.

Appendix B

Implementation Policy and Plan: Employee and Staff Safety Performance Appraisal

A. Policy

Each supervisor shall use the ES&H section of Employee Institutional Requirements (EIR) document as part of the basis for appraising safety performance of staff.

Each staff member must annually certify that he or she has read and understood the ES&H section of the EIR.

B. Implementation

Responsible Organizations

EH&S Division, in conjunction with Human Resources. Annually reviews and revises as needed safety performance expectations and guidance of the EIR and disseminates them to the divisions.

Divisions. Use the safety performance expectations of the EIR and adhere to guidance as tools for annual employee and safety line manager performance appraisals. Divisions are encouraged to add their own safety expectations related to current safety challenges as part of the Division ISM plan.

Schedule

June. Send out memo to divisions (division directors and their deputies, business managers, and HR centers) to remind managers, supervisors, and work leads to make safety a part of staff performance reviews for the current fiscal year.

Fourth quarter of fiscal year. Develop safety performance expectations for safety line managers and staff based on the ES&H policy statement in RPM Section 7.01, the LBNL and division ISM Plans, and PUB-3000 for the coming fiscal year.

August/September. Review and revise as needed ES&H section of the EIR document.

October. Disseminate EIR document and certification guidance to the divisions for the coming fiscal year.

Process

All staff must certify online that they have read and understood the applicable requirements of the EIR. The ES&H requirements of the EIR apply to all staff. This certification becomes part of each staff member's Job Hazards Questionnaire record.

In addition, ES&H should be included in the performance review process preparatory to employee interviews and development of performance review documents of employees covered by HEERA.

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Appendix C

Lawrence Berkeley National Laboratory

ES&H Standards

Change Management Process

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Appendix

1 Purpose

The ES&H Standards Change Management Process (CMP) defines how Lawrence Berkeley National Laboratory (LBNL) maintains a set of environment, safety, and health (ES&H) standards tailored to the hazards and activities at LBNL. The ES&H Standards CMP is a critical component of the LBNL Integrated Safety Management (ISM) System that provides assurance that employees, the public, and the environment are adequately protected. The CMP also describes how LBNL and the Department of Energy (DOE) Berkeley Site Office (BSO) integrate their ES&H Standards change management efforts.

1.1 Background

In November 2008, the BSO Contracting Officer determined that the existing process for necessary and sufficient standards, commonly known as the Work Smart Standards, had not been a timely mechanism for the inclusion or revision of requirements into Contract 31. In lieu of that process, the required use of the process outlined in Clause H.18 for all DOE directives to include those applicable to the environment, safety, and health, it was recognized that there was value in maintaining the ES&H requirements separate from the rest of Appendix I directives, so the list was renamed the *Environment, Safety and Health Standards for LBNL*. As “necessary” and “sufficient” standards would no longer have their prior connotations, the two lists were collapsed into a single list of standards. DOE Directive DOE M 450.3-1, *The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards*, was removed from the contract.

The ES&H Standards Set found in Appendix I of Contract 31 can be modified by the process outlined in Clause H.18. This document describes the CMP that LBNL uses to conform with Clause H.18 requirements.

1.2 Basis

U.S. Department of Energy, Contract No. DE-AC02-05CH11231 (henceforth referred to as Contract 31), Clause I.86, DEAR 970.5223-1, titled *Integration of Environment, Safety, and Health into Planning and Execution (December 2000),* specifies that before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements are established..

2 Applicability

2.1 ES&H Standards Set

The Necessary & Sufficient (N&S) ES&H Standards Set applies to all LBNL stakeholders (employees, guests, and visitors).

2.2 ES&H Standards Change Management Process

This process applies to the ES&H Standards Steering Committee, ES&H Standards Advisory Committee, ES&H Standards Coordinator (ES&H-SC), Standards Review Teams, Work and Hazards Review Teams, ES&H subject matter experts (SMEs), ES&H Standards Custodians (ES&H-SCus) and other stakeholders inducted into the ES&H Standards CMP.

3 Scope

Maintenance of the ES&H Standards Set involves a coordinated CMP on the part of LBNL and BSO stakeholders. This document defines the ES&H Standards CMP, the roles and responsibilities of the stakeholders, and the relationship of the ES&H Standards Set to Contract 31.

4 Stakeholders

LBNL and the Department of Energy are the primary stakeholders. BSO provides the local DOE representation. LBNL and BSO are the collective stewards of the stakeholder interests on behalf of the public domain and the environment.

5 Roles and Responsibilities

The roles and responsibilities of LBNL stakeholders are provided below.

5.1 Process Leadership

ES&H Standards CMP leadership is shared by LBNL and the BSO. ES&H-SCs representing both entities facilitate the overall process and are the primary liaisons among all ES&H Standards stakeholders. A Steering Committee and an Advisory Committee provide guidance and resolution authority for arbitration of issues that cannot be settled at the ES&H-SC and line-stakeholder levels. The LBNL EH&S Division and BSO senior management serve on these committees. The participants and their respective roles and responsibilities are described below.

5.1.1 Steering Committee

The LBNL EH&S Division Director chairs the ES&H Standards Steering Committee. The Steering Committee Chair inducts committee participants as necessary. The Steering Committee:

- Approves the ES&H Standards CMP;
- Approves changes to the ES&H Standards Set;
- Designates an ES&H Standards Coordinator;
- Provides guidance on high-level ES&H Standards issues;
- Negotiates with the BSO Steering Committee to resolve significant issues for which consensus in Advisory Committee or by ES&H Standards Coordinators has been unachievable.

5.1.2 Advisory Committee

The LBNL EH&S Division Deputy Director chairs the ES&H Standards Advisory Committee. The Advisory Committee Chair inducts committee participants as necessary. The Advisory committee:

- Provides advice to the ES&H Standards Coordinator;
- Negotiates with the BSO Advisory Committee member(s) to resolve issues on which the ES&H Standards Coordinators are unable to reach consensus;
- Promotes issues to the Steering Committee for which resolution has not been achieved at the Advisory Committee level.

5.1.3 ES&H Standards Coordinator

The ES&H Standards CMP is facilitated by the ES&H-SC. LBNL and BSO each provide one coordinator. The LBNL ES&H-SC:

- Is responsible for upkeep of this procedure;
- Initiates the ES&H Standards change management review and update processes as described in this procedure;
- Reports ES&H Standards CMP status and issues to the ES&H Standards Steering and Advisory Committees;
- Ensures the LBNL ES&H Standards Set is reviewed and updated;
- Evaluates and recommends changes to the ES&H Standards Set;
- Maintains awareness of significant changes to LBNL work activities, rules, regulations, consensus standards, and DOE directives;
- Ensures applicable standards are included in the ES&H Standards Set;
- Identifies LBNL SMEs and Technical Program Leads (TPLs) to serve on Standards Review Teams for the review of ES&H Standards;
- Identifies LBNL stakeholders to serve on the Work and Hazard Review (WHR) Team for the review of LBNL work hazards;
- Assigns a custodian for each standard in the ES&H Standards Set;
- Develops and distributes ES&H Standards CMP guidance documentation and review schedules;
- With the BSO ES&H Standards Coordinator, resolves issues on which the Standards Review Teams and WHR Teams are unable to achieve consensus;
- With the BSO ES&H-SC, provides the BSO Contracting Officer (CO) recommendations for changes in the ES&H Standards Set and consequently, Contract 31;
- Ensures ES&H Standards change management is documented in accordance with this procedure.

5.2 Contracting Officer

5.2.1 DOE

The DOE Contracting Officer:

- Interfaces with the ES&H Standards CMP through the BSO ES&H-SC;
- Notifies the BSO ES&H-SC of new DOE directives that may be subject to inclusion in the ES&H Standards Set;
- Uses the process specified in Contract 31, Clause H.18—*Application of DOE Contractor Requirements*, and Clause I.86—DEAR 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution*, to incorporate any updates of the ES&H Standards Set into Contract 31.

5.2.2 University of California Office of the President (UCOP)

The UCOP Contracting Officer:

- Receives the ES&H Standards Set changes from the BSO CO;
- Applies the changes to the official ES&H Standards Set posted on the UCOP contract Web site.

5.3 Standards Review Team

5.3.1 Lead

The Standards Review Team Lead:

- Facilitates the ES&H Standards review process for the team to which they are assigned (by the ES&H-SC);
- Verifies that each standard assigned to the team by the ES&H-SC or under the custody of the review team is evaluated;
- Assesses the value or need for tailoring;
- Facilitates review team consensus during the review process;
- Prepares the team report and submits the review results to the ES&H-SC.

5.3.2 Team Member

The Standards Review Team Member:

- As TPL or SME, maintains knowledge of new rules, regulations, consensus and industry standards, and DOE directives and associated changes to these standards within his or her area of technical expertise;
- Identifies and nominates newly promulgated or existing standards for consideration as ES&H Standards candidates;
- Reviews ES&H Standards assigned by the Review Team Lead;
- Reviews ES&H Standards for which he or she is the current custodian.

5.4 Work and Hazards Review Team

The WHR Team consists of the ES&H-SC, division safety coordinators (DSCs), EH&S Division liaisons, and other appropriate personnel as necessary [e.g., Principal Investigators (PI), lab supervisors, etc.]. The team validates that the current ES&H Standards Set is adequate for:

- Existing work performed;
- New work initiated.

The WHR Team evaluates changes in work activities to determine sufficiency of existing standards and recommends changes as necessary. The team also determines if ES&H Standards Set standards are no longer applicable due to work no longer being conducted.

5.5 Technical Program Leads, Subject Matter Experts, and ES&H Standards Custodians

TPLs, SMEs and ES&H-SCus:

- Monitor the regulatory network that affects their respective program and subject domains;
- Are custodians of the ES&H Standards elements applicable to their subject areas as assigned by the ES&H-SC;
- Are cognizant of changes in regulations, codes, ordinances, rules, standards and consensus, and industry standards within their program and subject domains;
- Serve on Standards Review Teams and WHR Teams as requested by the ES&H-SC;
- Maintain a general awareness of changes to work activities and/or hazards within the scope of their programs and assigned Laboratory sectors;
- Confer with the ES&H-SC to determine if identified changes in work or hazards require an ES&H Standards update;
- Review their respective PUB-3000 and other LBNL institutional and program documents and procedures to ensure that changes in requirements based on the

ES&H Standards Set are translated into documented lab policy (see PUB-3000, *Requesting a Revision to PUB-3000*);
- Review Job Hazard Analysis (JHA) sections relating to their technical program or subject matter to ensure change in the ES&H Standards Set is reflected appropriately in JHA questions.

5.6 Division Safety Coordinators and Liaisons

DSCs and EH&S Division liaisons support the ES&H Standards CMP by:

- Maintaining a general awareness of changes to work activities and/or hazards within their respective divisions;
- Serving on ES&H Standards Review or WHR Teams when requested by the ES&H-SC.

5.7 Line Management

Laboratory line management is responsible for assuring that LBNL ES&H policy is followed in the execution of work under their report. Line management and supervisors plan and conduct their work within the safety envelope defined by the ES&H Standards Set by:

- Using PUB-3000 as the environmental, safety, and health basis for their work;
- Becoming knowledgeable of specific applicable ES&H Standards Set standards while planning and performing their work;
- Reviewing their employees' JHAs;
- Consulting with the LBNL ES&H TPLs and SMEs;
- Notifying their DSC, liaison, TPL, SME, or the ES&H-SC directly of new work or conflicts between work they perform and the ES&H Standards Set.

5.8 LBNL Safety Advisory Committee (SAC)

The LBNL SAC must be consulted when change in ES&H policy is brought about. When the ES&H Standards CMP identifies changes to the ES&H Standards Set that induce changes in institutional ES&H policy, the SAC:

- Reviews and comments upon new and/or amended ES&H policy generated by TPLs, SMEs, and ES&H-SCus in response to ES&H Standards requirements changes.

5.9 LBNL Employees

Under ISM, LBNL employees engage in their respective work processes with the competency and level of knowledge deemed necessary by their supervisors. Employees engage in the work only after understanding the work scope, nature of hazards, the control of identified hazards, and general safe work procedures as gained through direct supervision, attending courses identified in their JHAs, and development and review of their JHA documents. Where applicable, employees interface directly with individual ES&H Standards Set standards, but for the most part are provided the blanket of regulatory requirements as embedded in the respective courses and training and knowledge of ES&H policies specific to their work. Employees address changes in hazards, work scope, or parameters to line management.

6 ES&H Standards Review and Update Process

ES&H Standards Set changes are initiated by one of two events: (1) identification of changes to work activities and/or hazards at LBNL (WHR); or (2) identification of changes to rules, regulations, consensus or industry standards or DOE Directives (Standards Review).

6.1 Tailoring Process

Contract 31 allows the BSO CO to prescribe that a DOE directive Contractor Requirements Document (CRD) be added to the ES&H Standards Set. When this occurs, the ES&H Standards-SC must:

- Initiate TPL or SME review;
- Respond to BSO within 30 days;
- Submit an alternative procedure, standard, system of oversight, or assessment mechanism to the requirements in a listed CRD by submitting to the CO a signed proposal describing the nature and scope of the alternative procedure; standard, system of oversight, or assessment mechanism (alternative); the anticipated benefits, including any cost benefits, to be realized by the contractor in performance under the contract; and a schedule for implementation of the alternative;
- Include an assurance signed by the Laboratory Director that the revised alternative is an adequate and efficient means to meet the underlying objectives of the CRD.

The tailoring effort is applied either to the complete or to individual elements of the newly identified CRD. The BSO CO responds within 30 days with either acceptance of the LBNL tailoring proposal or unilateral decision to incorporate the CRD. See Contract 31 clauses for exact contract language.

6.2 Change Management

“Change” with respect to the ES&H Standards CMP means publication of a new or modification, repeal, or sunset of an existing standard, regulation, code, rule, ordinance, directive or consensus, or industry standard. Change may also include renumbering or other editing of the name, title, reference number, or other notation characteristic of the citation. Change additionally reflects the assignment or removal of a standard from the ES&H Standards Set due to a change in work at LBNL. ES&H Standards change is accomplished through Standards Reviews and by WHRs.

6.3 Standards Review

Changes in standards are managed according to the process illustrated in Figure 1. The ES&H-SC may convene a standards review under any of the following categories:

- **Real Time**: at any time to evaluate one specific standard or DOE directive. Initiated by LBNL or BSO ES&H StandardsSC. Real Time review will typically be conducted when a new, or change in existing, DOE directive is published;
- **Periodic**: at a predetermined time to inclusively review a designated subset of, or the complete ES&H Standards Set (formerly the Annual Review and Update). The periodic interval is determined by the LBNL and BSO ES&H StandardsSCs on advice from the Steering and Advisory Committees. The ES&H StandardsSCs

will at least annually assess the need for convening a review of the ES&H Standards Set.

6.3.1 Standards Review Triggers

The ES&H-SC initiates a Standards Review based on the following triggers:

- Determination by the ES&H-SC, Steering or Advisory Committee that a periodic update and review is required;
- A TPL or SME alerts the ES&H-SC to a change in an existing ES&H Standard or to the publication of a new standard (typically a non-DOE regulation);
- A DSC, liaison, PI, line manager, or any other employee alerts the ES&H-SC of new work being undertaken that includes an ES&H component not addressed by the current ES&H Standards Set (see *Work and Hazard Review* below);
- Notification by BSO CO (via the BSO ES&H-SC) of a DOE directive revision or publication of a new directive that is considered applicable to LBNL operations and is to be considered for incorporation into Contract 31, Appendix I, per contract Clause I.86.

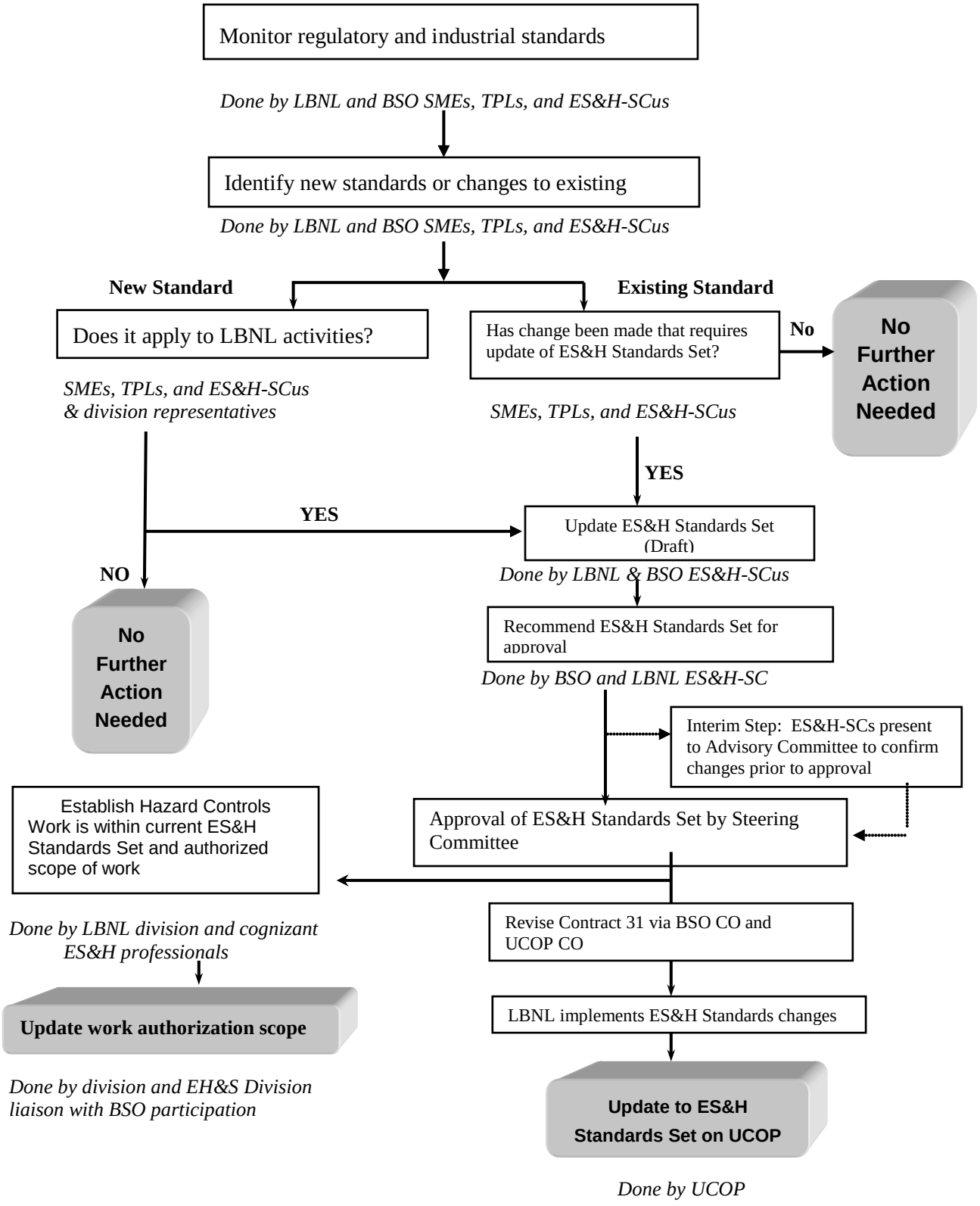

Figure 1 ES&H Standards Change Management Process—Changes in Standards

6.3.2 Standards Review Teams

The Standards Review Teams are designed to include cross-subject but related-issue ES&H Standards to maximize process efficiency and cover each major ES&H functional area. A review team lead and appropriate team members are assigned for each of five review teams based on subject matter or program expertise. The mandate for the team is to identify changes in standards and assure that the ES&H Standards Set remains appropriate as the Laboratory safety envelope. The teams include:

- **Environmental Protection**. Includes environmental regulations, hazardous waste transportation, hazardous waste management.
- **Facilities**. Includes facilities and infrastructure code, seismic, fire protection, and nonhazardous waste transportation.
- **Radiation Protection**.
- **ES&H Management**. Primarily DOE directives.
- **Occupational Safety, Health, and Medicine**.

6.3.3Non-DOE Standards

Non-DOE standards include:

- Federal and state laws and codes [United States Code, Public Law, Code of Federal Regulations, California Code of Regulations, California Codes (Health and Safety, Public Resources, Water, Labor, etc.)];
- City and county rules, ordinances, local publicly owned treatment works, ordinances, and municipal codes;
- Industry and organizational consensus standards (American National Standards Institute, National Fire Protection Association, American Society of Testing and Materials, American Conference of Governmental Industrial Hygienists, etc.).

6.3.4 DOE Directives

DOE directives primarily include:

- Manuals (which are designated DOE M), Notices (DOE N), Orders (DOE O), Policies (DOE P), Technical Standards (DOE STD);
- Unless independently nominated by LBNL, DOE directives are subject to incorporation in the ES&H Standards Set under current contract Clause H.18 (g). Where appropriate, and in the best interest of LBNL, the tailoring process shall be applied by the Standards Review Team and the ES&H-SC in the disposition of the directive or CRD.

6.4 Work and Hazards Review

Updates to the ES&H Standards Set due to changes in LBNL work and hazards are managed according to the process illustrated in Figure 2.

WHRs are necessary to ensure that work conducted at LBNL remains within the safety envelope defined by the ES&H Standards Set. The WHR is conducted at the division level. The ES&H-SC may convene a WHR for the following reasons:

- **Real Time.** As a result of ISM and work planning efforts or during routine internal reviews of ongoing work on a cue that new work or new hazards not addressed by the ES&H Standards Set may have been identified;

- **Periodic**. As a component of a formal periodic ES&H Standards Review and Update. The periodic interval is determined by the LBNL and BSO ES&H-SCs and the Steering and Advisory Committees.

Ongoing work that was planned and initiated within the framework of ISM and within the ES&H Standards Set safety envelope may have developed "scope creep." The WHR provides checks and balances against such occurrence.

6.4.1 Work and Hazards Review Triggers

The following triggers can cause the ES&H-SC to initiate a WHR:

- Determination by the ES&H-SC, Steering or Advisory Committee that a periodic WHR is required;
- When work planning conducted under LBNL ISM identifies work may not be covered by the current ES&H Standards Set safety envelope. The ES&H-SC is notified and convenes a WHR. A DSC, liaison, PI, line manager, or any other employee can alert the ES&H-SC of new work being undertaken that includes an ES&H component not addressed by the current ES&H Standards Set.

Work and hazard review elements of Division ISM Plans and the annual Division Self-Assessment efforts contribute to the efficacy of the CMP WHR.

6.4.2 Work and Hazards Review Teams

The WHR is performed on a divisional basis. WHR Team members, at a minimum, include the ES&H-SC and DSC, but may additionally include:

- PIs or work leaders;
- Liaisons, SMEs, or TPLs as necessary;
- Technical Assurance Specialists.

The WHR Team assesses whether current work conducted above line management level of authorization is within the ES&H Standards Set safety envelope. When a periodic review is conducted, the ES&H-SC distributes, and the DSC completes, the WHR Survey (see Appendix C1). The DSC or ES&H-SC may request the assistance of PIs, work leaders, liaisons, SMEs, or TPLs as necessary for verification of current work status.

If no new work or hazards not addressed by the current ES&H Standards Set are identified, LBNL ensures controls are in place for the current work and no additional action is necessary. If planned or proposed activities introduce new hazards that are not covered in the ES&H Standards Set, the team evaluates the hazard and recommends the appropriate change in the ES&H Standards Set. The ES&H-SC notifies the Advisory and Steering Committees and obtains approval of the recommendation.

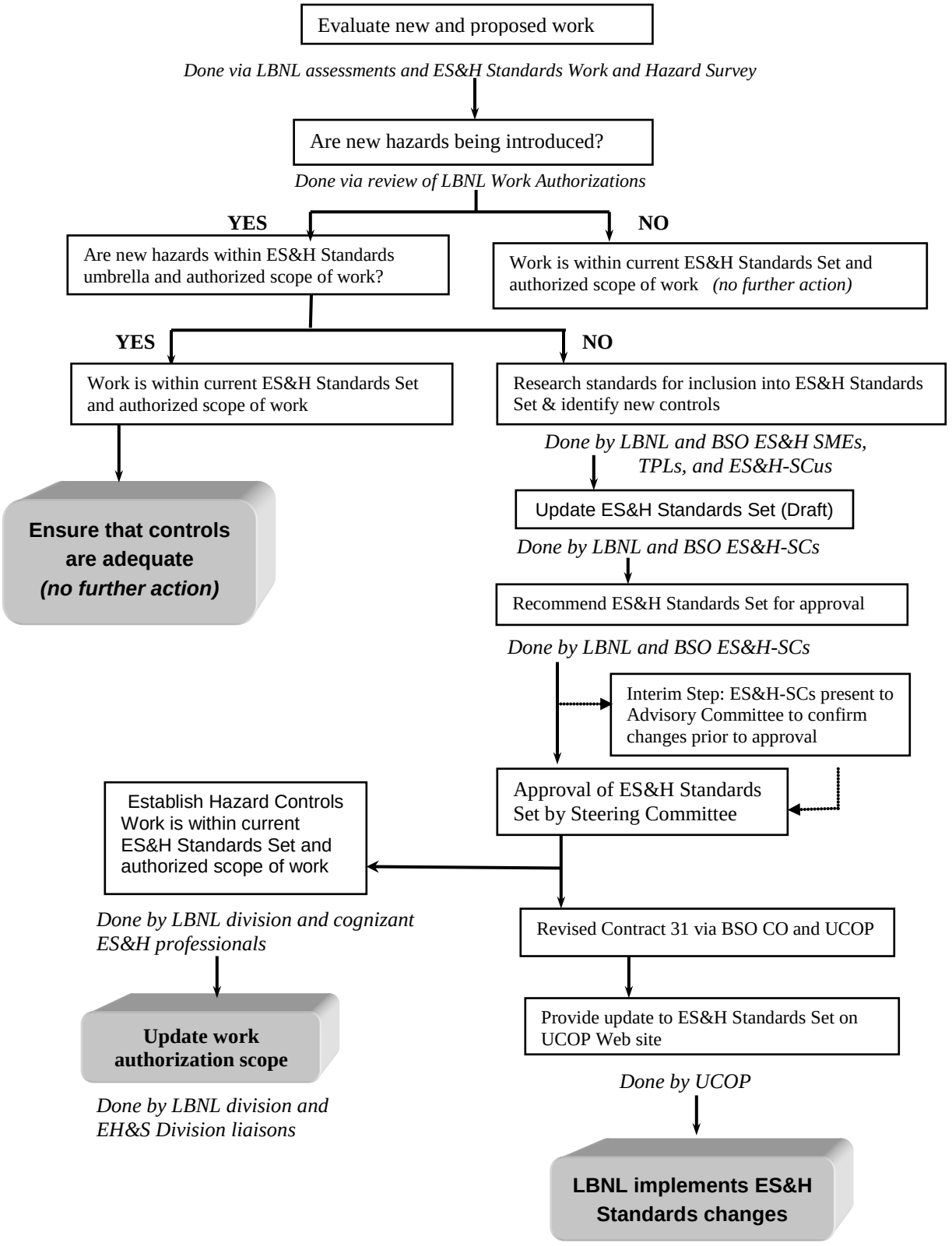

Figure 2 ES&H Standards Change Management for Changes in Work and Hazards

Work may not be initiated until the proposed change is reflected in the ES&H Standards Set and is appropriately codified in institutional policy or procedure. If the WHR identifies work in progress not bounded by the ES&H Standards envelope, the work must stop until appropriate ES&H Standards content is identified and matriculated into the Set and properly codified where necessary.

Proposed change is submitted by the LBNL and BSO ES&H-SC to the BSO CO. The BSO CO delivers the change to UCOP, where change in the ES&H Standards Set is effected (see Figure 2).

7 Implementation of ES&H Standards Changes

Changes to the ES&H Standards Set must be formally embedded in LBNL policy, procedure or other administrative program documents and effectively incorporated into daily LBNL work. The ES&H-SC assigns each ES&H Standard to a custodian responsible for monitoring changes in the standard and for assuring that each ES&H Standard is linked to LBNL work through specific policy, procedure, or other administrative bridge.

7.1 ES&H Standards Custodians

ES&H-SCus may include:

- Technical program leads;
- EH&S Division group leads
- SMEs;
- Other LBNL professional staff and stakeholders.

If the ES&H-SC receives a change recommendation relating to an existing ES&H Standard from a stakeholder other than the custodian, the ES&H-SCu is notified. A Real Time review may be convened. If the ES&H-SC receives a change recommendation relating to a standard not currently in the ES&H Standards Set, the ES&H-SC will make an appropriate custodian assignment and a Real Time review may be convened. If change to the ES&H Standards Set results, the ES&H-SCu is responsible for ensuring the change is reflected in LBNL policy, procedure, or other administratively bridging document.

7.2 Interface with PUB-3000 and Other Lab Policies and Programs

Changes to ES&H Standard requirements must be documented or codified in LBNL policy, procedure, or other administrative documents. The ES&H-SC ensures institutional flow-down through the process outlined in Figure 3 below.

8 Contract 31 Interface

The LBNL ES&H Standards Set is listed in Section J—Appendix I (*List of Directives*) to the UC/DOE Contract No. DE-AC02-05CH11231 (Contract 31) and therein establishes binding safety envelope requirements. Changes to the ES&H Standards Set are changes to Contract 31.

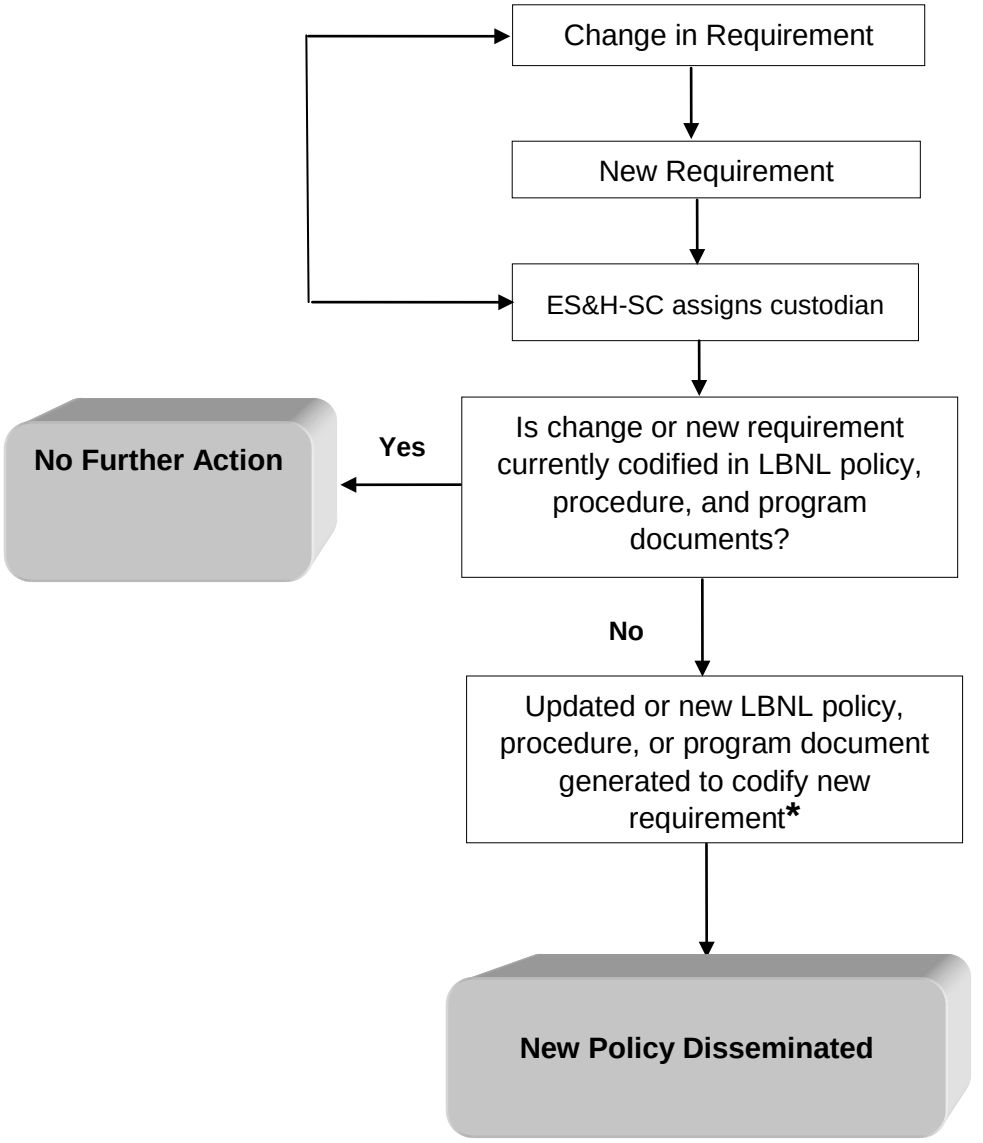

Figure 3 Codification of ES&H Standards Changes

8.1 Contract References

Specific contract sections that affect the ES&H Standards Set and the ES&H Standards CMP are:

8.1.1 Part II, Section I, Clause I.86—DEAR 970.5223-1

Integration of Environment, Safety, and Health into Work Planning and Execution. Part II, Section I, Clause I.79—DEAR 970.5204-2

Laws, Regulations, and DOE Directives [The Contractor will perform the work of this Contract in accordance with each of the Contractor Requirements Documents (CRDs) appended to this Contract as “Appendix I.”

8.1.2 Part I, Section H, Special Contact Requirements, Clause H.18

Application of DOE Contractor Requirements Documents (This clause defines the process by which LBNL may propose alternatives to the DOE Directive CRDs and defines the process by which the BSO CO may add CRDs to Appendix I, and therefore, to the ES&H Standards Set.)

8.2 Contracting Officer and Contract Update Protocol

Changes to Contract 31 must be made by DOE and UCOP contracting officers. Stakeholders nominate and submit ES&H Standards changes, through the ES&H Standards-SC, to the contracting officers.

8.2.1 DOE

The DOE BSO CO is the point official for submittal of recommended changes to the ES&H Standards Set. With concurrence of the Advisory and Steering Committees, the ES&H-SC submits ES&H Standards changes to the BSO CO.

8.2.2 UCOP

Upon approval of the submitted ES&H Standards Set changes, the BSO CO submits the recommended changes to the UCOP CO. The UCOP CO reflects the changes in the current official contract Appendix I, *ES&H Standards Set*, and updates the ES&H Standards Set posted on the UCOP Web site.

9 Review and Process Improvement

In accordance with LBNL ISM, the ES&H Standards CMP is critically reviewed by the LBNL and BSO ES&H-SCs at the conclusion of each periodic review and update cycle or as otherwise found necessary. The summary report for each review and update discusses specific process improvement, if identified, and defines the actions and responsible person(s) to effect such improvement.

10 Documentation

ES&H Standards change management requires basis documentation for all change. ES&H Standards change management documentation with the corresponding principal owner noted in parentheses includes:

- Current ES&H Standards Set (UCOP CO);
- Periodic review and update summary report (ES&H-SC);
- WHR Survey Form (ES&H-SC, DSC);
- ES&H Standards—Custodian Key (ES&H-SC);
- ES&H Standards recommended changes basis documentation (ES&H-SCu, ES&H-SC).

10.1 Hard Copy Files

The ES&H-SC shall minimize and discourage hard copy format for ES&H Standards Change Management documentation. When hard copy format is the primary record, it shall be archived according to LBNL policy. The ES&H-SC shall maintain a record of archived ES&H Standards materials.

10.2 Electronic Files

ES&H Standards change management documentation in electronic media format must be regularly backed up in accordance with LBNL policy. The ES&H-SC shall maintain a record of electronic media ES&H Standards material.

11 Training Requirements

Training is provided to stakeholders commensurate with their roles and affiliations with the ES&H Standards Set and the CMP.

11.1 All Stakeholders

General information on the ES&H Standards process and the current ES&H Standards Set may be accessed on the LBNL ES&H Standards Web site by any stakeholder.

11.2 Key Stakeholders

Key LBNL stakeholders must receive training that provides awareness of the ES&H Standards Set, the CMP, and their individual roles and responsibilities with respect to the ES&H Standards Set. Key LBNL stakeholders include:

- ES&H Standards Steering Committee;
- ES&H Standards Advisory Committee;
- EH&S Division and allied division SMEs and TPLs;
- Division safety coordinators;
- Division liaisons;
- Principal Investigators;
- Work leaders;
- Safety Advisory Committee.

The level and content of the training will be determined by the ES&H-SC at the time the stakeholders' participation in the ES&H Standards CMP is initiated.

11.3 Review Teams

In addition to Key Stakeholder training, ES&H Standards Review Team leads and members and WHR team members receive specific instruction from the ES&H-SC on the following:

- Specific expectations of the ES&H Standards Review Team (time frame, reporting, etc.);
- Detailed instructions on which standards are to be reviewed by which teams;
- How division work is assessed to arrive at ES&H Standards safety envelope compliance determination;
- Specific documentation requirements in support of recommended ES&H Standards Set changes;
- Specific information requirements when identifying new standards that assist the ES&H-SC in assignment of a proper ES&H-SCu;
- How to write the ES&H Standards Review and Update summary report (standardized format provided to team leads by the ES&H-SC).

12 References

Web site

LBNL ES&H Standards Web site

Contract Clauses

See Section I—Contract Clauses

13 Definitions

Definitions cited in the procedure.

Change. As pertaining to Change Management.

Contract 31 (UC/DOE). The legal document in which the ES&H Standards Set resides (cited in Appendix I to Contract 31), unto which the ES&H Standards Set requirements become binding.

Custodian. A TPL, SME, or other LBNL professional or defined group to whom each ES&H Standard is assigned.

DOE Directives. DOE manuals, notices, orders, policies or technical standards.

ES&H Standards Set. The collection of ES&H Standards uniquely identified through the DOE N&S Process that defines the safety envelope bounding the work conducted at LBNL. The ES&H Standards Set is a single line item of Appendix I of the UC/DOE Contract 31.

Industrial Standard. A standard, not necessarily codified by state, federal, or local agencies, but by consensus; an accepted and documented standard or best-management practice authored and promoted by industry, professional, and trade organizations.

Stakeholder. Laboratory employees and guests, BSO staff and guests, and members of the public who visit or live in the Laboratory community.

Subject Matter Expert. Lab professional staff who serve as the ultimate source of technical or regulatory authority for a designated subject. A list of ES&H SMEs is

provided on the “Who to Call” selection on the EH&S Division Web site directory. Some ES&H Standards-related SMEs may reside in disciplines closely aligned with, but residing outside of, the EH&S Division. Examples of SME disciplines are asbestos, biosafety, respiratory protection, and machine guarding.

Technical Program Lead. A TPL is the point-of-contact for a major ES&H (or closely allied discipline represented by another Laboratory division) category program area. A technical program may encompass multiple SME discipline subjects. Examples of technical programs are environmental protection, radiation protection, DOT transportation, and industrial hygiene.

.

Appendix C1

Appendix C1—Work and Hazard Review Survey

LBNL ES&H Standards

Periodic Review

Work and Hazard Review Survey

Section I - *Questions*		
Division:	**Date:**	
Division Safety Coordinator:		
1. Have new hazards been introduced through your Division's work activities? (If "No," go to Page 2, sign form and forward to BSO Representative. If "Yes," describe new hazard on Page 2 and continue to Question 2.)	**Yes ☐**	**No ☐**
2. Are new hazards covered by the current ES&H Standards Set? **(If "No," describe what hazard/part of the hazard the ES&H Standards Set does not cover. If UNSURE, contact the appropriate EH&S Subject Matter Expert and resolve before completing this survey.)**	**Yes ☐**	**No ☐**
3. Does the new hazard involve work off the Lab site? (If "Yes," check location below and describe the nature of the work in Section II, Box 3.)	**Yes ☐**	**No ☐**
Donner Lab ☐ Other UCB Campus Space ☐ Potter Street ☐ OSF ☐ **Downtown Berkeley ☐ Other DOE Lab ☐ Other Non-DOE within US? ☐ International Location? ☐**		
4. Are the Division's work and associated work hazards adequately covered by the current ES&H Standards Set?		
Yes ☐	**No ☐ (Explain on Page 2.)**	

Please proceed to Section II after completing this page.

LBNL ES&H Standards ***Work and Hazards Review Survey***
Periodic Review

Section II—Explanations, Comments, and Feedback	
Question	Explanation or Comment **(Use space with # that corresponds to question on Page 1.)**
1	
2	

Completed by:

Print Name	Signature	***Date***

Liaison Review by:

Print Name	Signature	***Date***

Reviewed by:

LBNL ES&H StandardsSC	***Date***

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Appendix D

Acronyms

AHD	Activity Hazard Document
ALD	associate Laboratory director
ALDO	Associate Laboratory Director for Operations
ANSI	American National Standards Institute
ASE	Accelerator Safety Envelope
BNL	Brookhaven National Laboratory
BSO	Berkeley Site Office
BUA	Biological Use Authorization
CATS	Corrective Action Tracking System
CDC	Centers for Disease Control
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHSP	Chemical Hygiene and Safety Plan
CMP	Change Management Process
CO	Contracting Officer
COO	Chief Operating Officer
CRD	Contractor Requirements Document
DART	days away, restricted, transferred
DEAR	Department of Energy Acquisition Regulation
DOE	United States Department of Energy
DOE SC	Department of Energy Office of Science
DSC	division safety coordinator
EH&S	Environment, Health, and Safety (Division)
EIR	Employee Institutional Requirements

ES&H	Environment, Safety, and Health (subject and policy)
EMS	Environmental Management System
ESG	Environmental Services Group
ES&H-SC	ES&H Standards Coordinator
ES&H-SCu	ES&H Standard Custodian
G&A	General and Administrative
HEAR	Hazards, Equipment, and Authorizations Review
HEERA	Higher Education Employer-Employee Relations Act
HWHF	Hazardous Waste Handling Facility
IBA	Institutional Budget Activity
IBC	Institutional Biosafety Committee
IHA	Integrated Hazard Assessment
IMP	Issues Management Program
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JBEI	Joint BioEnergy Institute
JGI	Joint Genome Institute
JHA	Job Hazard Analysis
JHQ	Job Hazard Questionnaire
LBNL	Lawrence Berkeley National Laboratory
LLA	Lessons Learned Administrator
MESH	Management of Environment, Safety, and Health
N&S	Necessary & Sufficient
NEPA	National Environmental Policy Act
NERSC	National Energy Research Scientific Computing Center
NIH	National Institutes of Health
OBA	Office of Biotechnology Activities (NIH)

OCA	Office of Contract Assurance
OSHA	Occupational Safety and Health Administration
P&PM	Procurement and Property Management Department
PEMP	Performance Evaluation and Measurement Plan
PI	Principal Investigator
PRD	Performance Review Document
PUB-3000	Publication 3000 (LBNL ES&H Policy Manual)
QA	quality assurance
RCM	Radiological Control Manager
RPG	Radiation Protection Group
RPM	Regulations and Procedures Manual
RPP	Radiation Protection Program
RRA	Roles, Responsibilities, and Authorities
RSC	Radiation Safety Committee
RWA	Radiological Work Authorization
SAAR	Supervisor Accident Analysis Reporting
SAC	Safety Advisory Committee
SKA	skill, knowledge, and ability
SME	subject matter expert
TABL	Today at Berkeley Lab
TPL	Technical Program Lead
TS	Technical Services
UC	University of California
UCOP	University of California Office of the President
WMG	Waste Management Group
WHR	Work and Hazard Review
WSHP	Worker Safety and Health Program